THE BRITISH JOURNAL OF PHOTOGRAPHY.

PUBLISHED WEEKLY.

VOL. LXIX.

1922.

HENRY GREENWOOD & CO., Ltd., Publishers, 24, WELLINGTON STREET, STRAND, LONDON, ENGLAND.
SALES AGENTS:—UNITED STATES, GEORGE MURPHY, INC., 57, East Ninth Street, New York.
CANADA: J. G. RAMSEY & CO., Ltd., 66, King Street West, Toronto. D. H. HOGG CO., 152, Craig Street West, Montreal.
T. EATON DRUG CO., Ltd., Winnipeg. STEWART PHOTO SUPPLY CO., 1033, Granville Street, Vancouver, B.C.
AUSTRALIA: KODAK (AUSTRALASIA), Ltd., Bond Street, Abbotsford, Melbourne. HARRINGTONS, Ltd., 386, George Street, Sydney. HERBERT SMALL PTY., Ltd., 270, Little Collins Street, Melbourne. GORDON & GOTCH, Ltd., Melbourne.
NEW ZEALAND: KODAK (AUSTRALASIA), Ltd., Dixon Street, Wellington. HARRINGTONS (N.Z.), Ltd., Willis Street, Wellington.
SOUTH AFRICA: LENNON, Ltd., P.O. Box 30, Cape Town. INDIA: HOUGHTONS (India), Ltd., Apollo Street, Fort, Bombay.
JAPAN: MARUZEN CO., Ltd., 11-16, Nihonbashi Tori Sanchome, Tokio.

INDEX.

The following abbreviations are used to indicate the nature of the subject matter :—

(Ans.) Answers. **(Cor.)** Correspondence. **(Pat.)** Patent News.
(Rev.) Review or Trade Notice. **(Soc.)** Societies' Meetings.

Throughout the Index, items relating to the following are entered only in the following sub-indexes, which are placed in their alphabetical position in the main index :—

Bankruptcies, Companies Registered, Deaths, Exhibitions, Names and Marks, Trade, Patents (Authors of).

SUBJECT INDEX.

For Names and Pseudonyms of Authors of Articles and Papers, see Index to Contributors, p. X.

COMPANIES REGISTERED.

NAMES AND MARKS, TRADE.

(*Applied for, registered, renewed, or removed.*)

PATENTS, AUTHORS OF.

INDEX TO CONTRIBUTORS.

COLOUR PHOTOGRAPHY.

VOL. XVI.

1922.

INDEX.

INDEX TO CONTRIBUTORS.

APPENDIX.

The following Supplementary Index includes the entries referring to articles, etc., on colour photography which have appeared in the "British Journal of Photography" during 1922.

HENRY GREENWOOD & CO., Ltd., Publishers, 24, WELLINGTON STREET, STRAND, LONDON, ENGLAND.

SALES AGENTS:—UNITED STATES, GEORGE MURPHY, INC., 57, East Ninth Street, New York.

CANADA: J. G. RAMSEY & CO., Ltd., 66, King Street West, Toronto. D. H. HOGG CO., 152, Craig Street West, Montreal.
T. EATON DRUG CO., Ltd., Winnipeg. STEWART PHOTO SUPPLY CO., 1033, Granville Street, Vancouver, B.C.

AUSTRALIA: KODAK (AUSTRALASIA), Ltd., Bond Street, Abbotsford, Melbourne. HARRINGTONS, Ltd., 386, George Street, Sydney. HERBERT SMALL PTY., Ltd., 270, Little Collins Street, Melbourne. GORDON & GOTCH, Ltd., Melbourne.

NEW ZEALAND: KODAK (AUSTRALASIA), Ltd., Dixon Street, Wellington. HARRINGTONS (N.Z.), Ltd., Willis Street, Wellington.

SOUTH AFRICA: LENNON, Ltd., P.O. Box 39, Cape Town. INDIA: HOUGHTONS (India), Ltd., Apollo Street, Fort, Bombay.

JAPAN: MARUZEN CO., Ltd., 11-16, Nihonbashi Tori Sanchome, Tokio.

Printed by The Avenue Press, Drury Lane, in the County of London, England.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3218. Vol. LXIX. FRIDAY, JANUARY 6, 1922. Price Fourpence.

Contents.

SUMMARY.

Mr. J. Malton Murray sends us an account of one of the leading portrait establishments in New Zealand, namely, the Bartlett studio at Wellington. (P. 3.)

In a leading article we lay emphasis upon some of the items requiring special care in the use of large-aperture lenses. Neglect of such considerations is frequently the cause of a lens being blamed for defects which it does not possess. (P. 2.)

Full working details for the Carbro process were recently given by Mr. A. C. Braham in the course of a demonstration of this method of making carbon prints at the Royal Photographic Society. (P. 4.)

In a recent paper in the "Physical Review," Mr Charles B Hodgman has given formulæ for a large number of light-filters, together with indications of their spectral properties. (P. 6.)

The Royal Photographic Society has already announced the date for the forthcoming autumn exhibition, namely September 18 to October 28. (P. 1.)

Official notice has been published of the registration as a company limited by guarantee of the Professional Photographers' Association of Great Britain and Ireland. (P. 10.)

Objection to an autumn P.P.A. Congress and recommendation of petrol vapour incandescent lamps for portraiture are the subject of letters from correspondents. (P. 11.)

A fitment for holding framed pictures conveniently for copying, and also for allowing a suitable adjustment of the artificial lights, is described by a contributor to "Assistants' Notes." (P. 7.)

A new type of non-slip printing frame and a machine for glazing are described in recent patent specifications. (P. 8.)

A process has been devised for the regeneration of hypo from fixing baths simultaneously with the deposit of the silver contained in the solution. (P. 2.)

Ownership of copyright in photographs made independently by an employee may at times be highly obscure in the absence of clear business arrangements. (P. 1.)

"COLOUR PHOTOGRAPHY" SUPPLEMENT.

In a contributed article, Mr. H. J. Campbell is at pains to show the facility and quickness of making three-colour paper prints by the Raydex process. He describes his own manipulation in detail. (P. 1.)

Particulars of a modified two-colour process, patented by J. F. Shepherd and Colour Photography, Ltd., in which a yellow image is added to a combination of blue, green and pink, are given on page 3.

The Goraky process of colour cinematography has been supplemented by a new optical device for the simultaneous taking of the three colour-sensation negatives. (P. 4.)

Further details of the automatic three-colour camera of A. Ronald Trist will be found on page 3.

EX CATHEDRA.

The R.P.S. Exhibition. In the current issue of its Journal the Royal Photographic Society makes early announcement of the time which has been fixed for the next annual exhibition, namely, from September 18 to October 28, 1922. This will be the sixty-seventh of the exhibitions which have been held without interruption and, as in the case of others during recent years, will comprise not only pictorial photography but colour transparencies and colour prints and scientific and technical exhibits relating to photography. We are very glad that this early announcement has been made, and we take this first opportunity of drawing the attention of technical and scientific workers throughout the world to the service which they can render photography and the Society by contributing to this section of the exhibition. We are sure we can say, on behalf of the Society, that it will welcome exhibits illustrating the applications of photography in manufacture, research and nature study, and also work by photo-micrographic and X-ray methods in the same fields. Anyone having employed photography in these ways is asked to place himself or herself in communication with the Society for the purpose of making the forthcoming scientific and technical section fully representative of what is being done in the various countries of the world. Full particulars of the exhibition are obtainable on application to the Secretary, 35, Russell Square, London, W.C.1. The latest day for the receipt of entries is August 25.

* * *

Copyright in Semi-Free-Lance Photographs. A question which not infrequently arises as to the ownership of copyright is concerned with the taking of photographs, say for newspaper illustration, by a photographer who is employed to make them for a firm or individual, and at the same time has the opportunity of taking subjects "on his own." It is hardly necessary to explain that the copyright in photographs taken by such a photographer in the course of his ordinary employment are the property of his employers; and in the absence of evidence to the contrary it is a natural assumption that all photographs made by him become the property of the person or persons regularly employing him. Disputes in these circumstances arise from the absence of definite evidence that such and such exposures were made for the employers and such and such others by the photographer for himself, presumably at his own expense in materials and out-of-pocket charges. It would seem that even when there is a definite general agreement that a photographer shall take subjects for himself in the intervals of work for his employers, there can be no certainty as to the ownership of the copyright in a given subject except by a written document formally earmarking such and such subjects as having been made by the employee on his own initiative and at his own cost.

Unquestionably the disputes which arise in circumstances such as these would be avoided by a straightforward business system which would distinguish in writing between one section and the other of the photographer's work.

* * *

Hypo Recovery. A method of throwing down the silver contained in used hypo baths and at the same time of regenerating the hyposulphite for the fixation of further negatives or prints has recently been patented in Germany by A. Steigmann. According to the "Kolloid Zeitschrift" the process consists in adding to the exhausted fixing bath, which preferably should be heated to a temperature of 120 to 140 degs. F., a small proportion of sodium hydrosulphite, commonly called "hyposulphite" by chemists, together with an equal weight of soda carbonate. The result of this addition is to throw down the silver as a granular deposit of the metal. It is stated that after filtering off the silver mud the bath is ready for further use. Apparently, the action of the hydrosulphite takes place only in an alkaline solution, and therefore is not applicable in the seemingly simple form described above to acid fixing baths, which would require considerable addition of carbonate of soda for the neutralisation of the acid or acid salts in them. In any case, we should not regard the process as of value, except in treating large quantities of bath, such as those used in the fixing of cinematograph films. Even at the present price of hypo, recovery of this latter for use again is a proposition of extremely doubtful economy; and if the sole object of treating exhausted baths is the recovery of the silver contained in them, it is unlikely that a more satisfactory process can be found than the one commonly in use of adding a sufficiency of liver of sulphur.

BLAMING THE LENS.

The growing use of large-aperture lenses calls for much more skill and care in their working than most workers realise, as conditions under which an instrument with an initial aperture of *f*/8 will work quite satisfactorily are not at all ideal when the aperture is increased to *f*/3 or even *f*/4.5. We have recently had complaints as to the performance of lenses of high reputation, the charges being that they were deficient in covering power and that they had even less depth of definition than could have been reasonably expected.

Before condemning a lens, it should be ascertained beyond all doubt that the fault is not in the camera. The present tendency is to build cameras with the idea of portability rather than rigidity, and it is probable that this is to blame for many defects for which the lens is blamed. The majority of very rapid lenses are fitted to light hand-cameras, and these are more easily put out of truth than most people are aware. Cameras in which the front is supported by metal uprights call for very careful usage, as they are easily strained to an extent that will vitiate the performance of the most perfect lens. It is difficult to detect this by any ordinary method of inspection or measurement, especially when the front is much smaller than the plate, so that recourse must be made to some such device as that, which we believe was first suggested by Messrs. Taylor, Taylor and Hobson. It is the use of a small but delicate spirit level. Assuming that the ground glass is parallel with the back frame of the camera, the latter is stood upon a carefully-levelled surface, and the level placed upon the front cell of the lens. If the bubble is stationary while the level is turned round it may be assumed that the necessary degree of parallelism exists. Greater accuracy may be attained by levelling a glass plate upon three screws, and after removing the plate, standing the focussing screen directly upon the screw points or heads, as the case may be. This eliminates any error which might occur from unevenness in the back frame due to inequality in leather covering or the slight projection of fittings. This test will not, of course, indicate whether the error, if any, is due to the front or back of the camera being out of truth; it may be that in some cases the central position of the swingback has been incorrectly marked or that its fittings have been strained.

Next in importance to parallelism of front and back comes the register of the slides with the focussing-screen or the scale of distances. This, when working with large apertures, must be extremely accurate, for although it may not be so wrong as to give the impression of general unsharpness, it may so far disturb the relative positions of the pointer or screen as to give the effect that the lens is lacking in depth, the fact being that all the available depth is in front or behind the point upon which the lens was supposed to be focussed. Slides and screens of the ordinary type are easily tested by means of a simple depth gauge consisting of a stout strip of wood through which a screw passes. The strip is placed across the frame of the slide or screen and the screw turned until it just touches the surface of the ground glass or plate. We have found it a good plan to place a cigarette paper between the screw point and the glass and to bring the screw down till it only just allows the paper to be withdrawn. This is more certain than trusting to inspection of the contact, for if the spring behind the plate is weak the screw may press it down, and in such a case there would be enough pressure to hold the paper. It is desirable to test various parts of the surface, as it is possible that one end of the plate may be farther from the lens than another. As an illustration of the necessity for accuracy in register, it may be mentioned that a well-known optician uses for testing a dark slide of which the frame is made of stout brass, the focussing being effected upon a ground glass plate, which is replaced by the sensitive plate for exposure.

The scale-focussing arrangement often leaves much to be desired, even assuming that the distances are accurately marked. The principal fault is too great a distance between the pointer and the engraved surface. In such a case it is difficult to set the scale twice to exactly the same point. Bending or twisting of the pointer increases the risk of error.

A supposed lack of covering power is sometimes caused by constructional defects in the camera or exposing shutter. An inner frame may actually obstruct the field of the lens; or a before or behind lens shutter, by reason of too small an opening, may do the same thing. If this be suspected the lens should be fitted upon a camera of sufficiently large size to allow of the whole circle of illumination being received upon the ground glass.

Unsatisfactory definition of the image as a whole may be, but seldom is, due to faulty construction of the lens, but is more often caused by some injury which has disturbed the adjustments. A common cause is careless fitting to a between-lens shutter. If the lens has been fitted by the maker there is little likelihood of this, but if a camera maker has done the work it is possible that he may have gone wrong in several ways. The faces of the mount may not be parallel, the front and back tubes may not be concentric, or, a most important point, the separation between the components may be altered. It has occurred that when the length of the lens tube has prevented a camera from closing, the workman has calmly turned down the tube until it is short enough. When

such fitting has taken place it is a necessary precaution to compare the work of the lens in the shutter with that which has been done with it in the original tube.

Good lenses should be disturbed as little as possible. Constant unscrewing of the cells for cleaning is apt to wear the threads and destroy the centering, and on no account should the glasses be removed from their cells, the turning of a lens of a few degrees having sometimes a distinctly prejudicial effect upon its performance.

If a lens does not come up to the purchaser's expectations, the safe and proper course is to send it direct to the makers for inspection and report. It is as detrimental to the maker as to the user for a faulty instrument to be in circulation, and if the lens be actually faulty it will probably be put right without charge, even if the fault be not acknowledged. We recently handled a lens by a good maker, which was obviously defective, and on returning it were informed that one of the combinations belonged to another series. It was immediately put right free of all cost, with thanks for submitting it.

PROFESSIONAL WORK IN NEW ZEALAND.

In New Zealand a photographic studio which employs two or more persons, including the proprietor if he works in it, is a factory within the meaning of the Factories Act. This is no degradation to the profession, although it has had curious results. For instance, during the war, when parents and relatives were clamouring for photographs of the boys going to the Front, the Bartlett Studio was prohibited from working all the overtime it would have worked, because the Department of Labour had to see to the due enforcement of the law. Consequently, many relatives were kept waiting longer than they would have been if things had been otherwise.

I have been told that the best work—at any rate, the most expensive work—is turned out in Christchurch. I had a couple of busy days in Christchurch a little while ago, but had no opportunity to interview photographers there. Perhaps some day in the future I may have that pleasure, as it is almost certain I shall visit Christchurch more than once again.

In the meantime, however, I have had the pleasure of a chat with Mr. Andrews, who controls the Wellington Branch of the Bartlett Studio, the other being in charge of Mr. Bartlett at Auckland. This studio may fairly be considered as one of the best in New Zealand. I am not in a position to pass judgment on the professionals here as a body. But I am quite sure that anything that equals or excels the work turned out by the Bartlett Studio must be something very good indeed. This being a democratic country, there is, speaking broadly, no graduation between the studios doing first-class work and those which one might, without offensive intention, describe as just ordinary. There are, I understand, good workers here and there in some of the larger provincial towns, but it is in Wellington, Christchurch, Auckland and Dunedin that one finds the best workers. The other towns have not a population able to support the man who does high-priced work.

The work of the Bartlett Studio is of a very high order, and equals, I think, that of the best work at home—always bearing in mind that the run of customers able to appreciate really artistic work is limited. In the reception room at Wellington one may see some really choice examples. The room is, by the way, a very tastefully arranged one, calculated to make a favourable impression. Mr. Andrews is a young man of energetic temperament and decisive personality, who thoroughly understands his work. His taste may be gauged from the circumstance that he is an admirer of the work of Bertram Park and Pirie Macdonald. Also he likes to make soft-focus portraits, although he has to subordinate his love for this class of work to meet the wishes of many of his sitters. He had experience at home, and while there considered that Walter Barnett ranked amongst the soundest and best of workers.

Mr. Andrews has very definite ideas on treatment. He never photographs a man against a light background. He used in my case a dark green background and a blue side screen. He does not consider a light background suitable for masculine portraits. Neither will he put men into ovals and circles. The strong rectangular is, in his view, the correct form for virile male portraits—and he certainly succeeds in producing portraits distinguished by life and character.

There is furniture in the studio, but Mr. Andrews photographs people, not furniture. He mentioned in chat having removed a high-backed elaborate chair—suitable for a bishop—because so many people wanted to be taken seated in that chair, which was quite unsuitable in most cases. What furniture there is, is good.

Daylight is used for most exposures, but there is a small battery of half-watt lamps for night work or use blended with daylight. To the sitter's left there are three 3,000-c.p. lamps hung high behind a diffuser, and one 2,000-c.p. to the front and right of the sitter. Mr. Andrews does all his own operating, and is a deft hand in the studio. It is big enough to accommodate a group of 60.

Before the war platinotype was the principal process. Now the work is almost exclusively development paper, toned. Folio mounts are invariably used, with the print usually mounted with a margin of harmonious tint superimposed upon soft-toned brown mounts. At one time India proofs were a feature; the sketch portrait fashion had a certain vogue, but the studio sticks to sound, entirely good work that one can bear to live with day by day. There is no straining after freak effects; everything is artistically sound, and yet there is variety in treatment and individuality about each portrait.

The studio sticks to studio work. Outdoor and home photography are not sought after, and no attempt is made to cater for amateurs in the developing and printing line. Outdoor work here is not easy. In Wellington particularly a still day is rare—generally there is a breeze, and often half a gale of wind. One gets used to that, and goes sniffing for a breeze if a quiet day happens along. But as a photographic proposition, garden parties and the like are not attractive, and the results little likely to enhance the photographer's reputation. The fact that Mr. Andrews has had no slack time for ten years would seem to show that the policy followed is correct.

The prices obtained may be estimated from the following:—

	£	s.	d.	
Whole plate in folio mounts ...	5	5	0	per doz.
Cabinets in folio mounts ...	3	10	0	,,
Cabinets similar in style, smaller	2	10	0	,,
C.D.V. or thereabouts ...	1	10	0	,,

Enlargements range according to size and finish all the way from one guinea to ten guineas, framed complete.

Most of the business is done on a credit basis. The cash business is small, and bad debts practically negligible. The studio is run on business lines, with card files and files of proofs enabling back items to be turned up rapidly when reprint orders are received. The workrooms are well laid out and efficiently conducted. Mr. Andrews has an eye for talent, and he pays a salary of £550 per annum to a man who began some years ago in the studio on quite humble work. But he developed, introduced a feature that made a substantial

saving in the workrooms, and now does work that two men previously did.

There is no apprenticeship system. Juniors are started, and if they prove capable they get plenty of opportunity to progress. It is worth noting that Mr. Bartlett had a valuable ally for some years in a man who came out from home. Contrary to our Canadian friends, the New Zealand photographer seems to have been fortunate in the quality of assistant who has come from the Old Country to these shores.

The studio favours British goods, although its experience in recent years has not provided encouragement. At present the conditions do not, in Mr. Andrews' view, tend to the development of consumption of British material. It takes a long time to get material from home, and if any of it should chance to be faulty the waste of time, correspondence, and inconvenience are heavy adverse factors.

The Bartlett Studio photographs all the celebrities as well as the humbler elements of social life here. The folk up country come to Wellington for a holiday and to have their photographs taken. Many of the studio's customers are families, and one or another is always coming along. As a matter of fact, I believe if the studio were removed from its present central position in Wellington to some private and out of the way domicile, the clients would follow. There is, of course, only a limited opening for professionals doing the quality of work turned out by the Bartlett Studio. And although I don't suppose Messrs. Andrews and Bartlett would mind in the least, I do not advise any professional at home who is on a good wicket to set sail at once for "Noo Zee." We are doing our little best to keep smiling under the thumps of a pounding slump, and it's likely that the wealthy sheep-farmers who are now selling (at 9s. per dozen) sheep, complete with fleeces—that cost them 33s. each—will not be spending lavishly on photography for a while. That Mr. Andrews is as busy as ever during such a slump will, I think, be admitted as evidence that I have not exaggerated his ability as a business man and an artist.

J. Malton Murray.

THE CARBRO PROCESS.

[The following full report of the demonstration of the Carbro process, given by Mr. A. C. Braham before the Royal Photographic Society, is published in the current issue of the Society's "Journal," and is of particular value on account of its clear instructions in the making of Carbro prints by so practised a worker in the carbon process as Mr. Braham. The many examples of the process shown on the occasion of the demonstration amply illustrated the ability of the Carbro process to give the full gradation of the negative through the medium of a bromide print. Mr. Braham, whose opinion merits every respect, specifically declared that an expert carbon printer could make as good a carbon print by this process as the best he could make in the ordinary way by printing on carbon tissue, with the single qualification that there would be a difference if the negative was one containing critically sharp detail which it was required to reproduce.]

Mr. Braham reminded his audience that the process was founded upon Ozotype. The final picture was a carbon print made from a bromide print. The first chief requirement in Carbro printing was plenty of water and its free use. The worker must remember that he was dealing with a bromide print, and there was a danger that bleaching might not be regular, consequently the risk of getting patches unless the wetting was complete; also the tissue after it had been in the bath was thoroughly expanded, and if a piece of transfer paper which had only been perfunctorily soaked were taken and the two papers brought together, one of them having been thoroughly expanded and the other not, there was a stress and pull upon them, and complete contact would not be obtained.

The working baths consisted of the following formulæ:—

Stock Solution No. 1.

Potass. bichromate	1 oz.
Potass. ferricyanide	1 oz.
Potass. bromide	1 oz.
Water	20 ozs.

Stock Solution No. 2.

Glacial acetic acid	1 oz.
Hydrochloric acid (pure)	1 oz.
Formaldehyde 40 per cent.	22 ozs.

For Use—First Bath.

No. 1 stock solution	6 ozs.
Water	18 ozs.

For Use—Second Bath.

No. 2 stock solution	1 oz.
Water	32 ozs.

The second or acid bath should be made fresh each time of use; the other might be used for a considerable time. The temperature of the baths was important, and it was as well to work at a temperature which was constant.

Mr. Braham then recapitulated the various stages. In the first place the worker provided himself with a good bromide print. That bromide print was soaked in water, so that it thorough wetting being that in that case the absorption between the bromide print and the tissue which had been in the bath of potassium bichromate and ferricyanide would be equal. The tissue was immersed in the first (the potassium bichromate and ferricyanide) bath for three minutes. Then came the critical point when the user of the process must decide on the nature of the transcript of the bromide that he wanted. This governed the time in the second (the acid) bath. If it was desired that the Carbro print should be like the bromide, 20 seconds would be about the time; if greater contrast was desired, a shorter time would be given, and if a flatter result, a longer time. But the number of seconds was always conditioned by the particular bromide paper which was being used, although the rule held constant for all bromides; the more time the softer the result, the less time the harder the result.

Having put the tissue into the second bath for the required time, it was taken out and brought into contact with the bromide print, squeegeed, and allowed to remain in contact for a quarter of an hour, which was usually sufficient, although if a decidedly darker print was wanted, it might be left for 20 minutes or even more. The tissue and print should be put between grease-proof paper, because the use of bibulous paper resulted in the abstraction of some of the solution from the tissue, with the result that there might be patches. The tissue having remained in contact for a quarter of an hour or the stipulated time, it was stripped away from the bromide print, the bromide print was put into the dish to wash, and the tissue was brought into contact with a piece of transfer paper which had previously been soaked for a good time in cold water.

The print then remained in contact for, say, half an hour, and development took place as in the case of a carbon print, though it had to be borne in mind that the solubility was greater, and that a lower temperature should be used for the Carbro print than would be used for making the carbon. When the development was more or less complete, hotter water could be used, if desired, just as in ordinary carbon printing, but the start should always be made slowly.

Mr. Braham carried through the various manipulations, and mentioned other points as he went along. It was always desirable to have a white margin on the bromide as a safe edge. Sufficient depth of solution in the bath was desirable so as to avoid airbells, for a good depth enabled one to slide a piece of tissue under the surface. During the immersion of the tissue in the first bath he rocked the dish gently so as to break any airbells which might be present. At the end of three minutes he removed the tissue and allowed it to drain for 15 seconds, then dropping it into the acid bath and again rocking the dish. At the end of 20 seconds he took it out again and laid it squarely on the print. A palette knife was extremely convenient for lifting after squeegeeing papers on to one another or on to a glass support, and that was one of the necessary tools in this process. The tissue having been squeegeed on to the bromide print, was kept in contact for a quarter of an hour in order that the bleaching action might be complete.

It would be asked what sort of bromide was best for using with Carbro? Any type of bromide could be worked, although gaslight prints were not so satisfactory as the normal bromide. He had used various makes of paper; all of them worked, but a difference would be found in the time which various papers required in respect to the acid bath. That was a matter which each worker must determine for himself by experience. With regard to the number of Carbro prints which could be made from one bromide, he had been accustomed to say that the limit was ten, but he had had to revise his estimate. He passed round a bromide print from which fifteen Carbro prints had been taken, and it was still, apparently, as good as ever. That print had been fifteen times soaked, and fifteen times brought into contact with the tissue, and fifteen times stripped and washed, developed, and washed again. But there was not even a trace of blistering, although usually, when a bromide print was used time after time, if the paper did not disintegrate, the gelatine blistered.

A print of a kind could be made without the interposition of the acid bath at all, and he showed an example or two, but such a print was almost invariably clogged up in the shadows and had the high lights washed out. With regard to the times in the different baths, the time in the acid bath was governed by the worker's own fancy for a particular result, but the time in the case of the first bath was fixed at three minutes, with the one exception of the case of red chalk, where a modification had to be made. Evidently the pigment employed had some effect on the gelatine.

After the tissue and the bromide had been in contact for the required time the tissue was stripped away and brought in contact with the soaked transfer paper and squeegeed. He did not use any pressure to prevent curling, as with proper squeegeeing this was unnecessary. The washing of the bleached prints should be thorough, and they could be redeveloped with ordinary developer.

As the effective part in a bromide print was reduced silver, it had occurred to him that it might be possible to make some paint of the nature of water colour which should contain silver so as to serve in working up a bromide print which could then be reproduced a dozen times in as many Carbros. He showed a bromide which was worked up in this manner, with a water-colour containing Indian ink. Just a few touches of the brush charged with the pigment were given, and all those touches were reproduced in the Carbro as part of the Carbro image, with as complete a transference, thanks to the reduced silver in the pigment, as any other part of the bromide.

In reply to questions, he said that if olive brown or sepia were used, the time of immersion in the acid bath must be varied. With the normal time, olive brown gave a flat, and sepia a harsh, result.

Asked whether the combined bath had been given up, and what were the outstanding differences between that and the original Ozobrome bath, he said that the question of the original Ozobrome bath was one that he could hardly answer. It was a patented process, and the baths were sold as proprietary solutions. In the single bath method there was not the means of control by varying the time. The differences in result he had been able to secure through the modifications which were made possible by the two baths would be sufficiently evident from his demonstration. This, he thought, was a considerable advantage, even if it was the only advantage to be gained from the new method. He did not want to discuss the old method, but rather to emphasise the possibilities of the new.

Asked whether he used ordinary unsensitised carbon tissue, he said that this was necessarily so. Any of the ordinary tissues were available. As to a matt or glossy surface, he preferred a matt surface, which was easier in manipulation. In the Carbro prints the detail was rather on the soft side, but the carbon process itself did render such knife-edge sharpness wherever needed, that he wondered whether a glossy surface would render that detail on the final print.

On the question of matt or glossy surfaces in general, he preferred a matt effect, but there was no reason why a glossy paper should not be used. With regard to detail, if it were a case of the reproduction of a mechanical drawing, he did not think that sharpness in the same sense as lens-sharpness would be so well forthcoming in the Carbro as in the carbon print, but in pictorial subjects this did not signify. Here what was involved was a diffusion process, and the action in Carbro was lateral as well as downward, so that, speaking in absolute terms, there would be a loss of sharpness.

In reply to other questions, he said that he did not fix the prints in hypo after redevelopment, but used them as they were. If a bromide intensified by re-development, he thought that it was a case of slovenly work, the print not having been properly washed. As for the necessity for immediate redevelopment, he had believed that this necessity held good, until, working at an exhibition when he had no chance to redevelop immediately, he found that on redeveloping after two days there was no difference. In a case in which there were stains on the bromide of which the worker had been unable to get rid, he would be inclined to ask what was the matter with the original bromide print? Asked whether the development of the bromide print to begin with had any marked bearing on the result, he said that he thought it had: if development had not been full, there was not that reduction of silver which was required, and also the silver was not in the condition in which it gave the best results. The development of a Carbro print, he said, in reply to another question, might be done at a decidedly lower temperature than a carbon. If a print was too dark notwithstanding the warmth of the water, ammonia could be put in the developing water, but he did not like this procedure. Asked whether he had ever experimented by making Carbros from bromide prints, which had been treated with an intensifier or a reducer, he said that he did not see any reason why a bromide print should not be used, a part of which had been removed with ferricyanide.

A Prosperous Film Company.—Declaring a dividend of 15 per cent. on the ordinary shares at the annual meeting of the Stoll Film Co., Ltd., Kingsway, Sir Oswald Stoll said that very few companies in the industry had done so well. "The film industry in general," added Sir Oswald, "is one which, when it casts its swaddling clothes and acquires strength in limbs, brains in its head, and more character in its composition, is going to astonish mankind with its general usefulness."

The Soho Reflex. We have always had the highest opinion of the Soho reflex camera, which embodies within itself practically every feature which the ideal reflex should have, and, moreover, is of light and most workmanlike construction. An illustrated booklet of the various models has just been issued by Messrs. Amalgamated Photographic Manufacturers, Ltd., 3, Soho Square, London, W. It contains a full list of the reduced prices for these cameras which have come into force at the beginning of the present month. Photographers will congratulate Messrs. A.P.M., Ltd., on the reputation for excellence of design and workmanship which this camera of all-British origin and manufacture has obtained throughout the world.

LIGHT-FILTER FORMULÆ.

THE following short paper from the "Physical Review" collects the results of a large number of experiments made by Mr. Charles D. Hodgman, of the Case School of Applied Science, primarily for the production of light-filters for three-colour photography. As will be seen, however, the series include many filters applicable in photography of coloured objects on orthochromatic and panchromatic plates.

In the course of a somewhat extended study of the processes of three-colour photography a considerable number of filters of various types have been worked out. They include a series of three-colour filters of varied extent and abruptness of absorption, various yellow or orange contrast or compensation filters, and others for various special uses, such as photo micrography and contrast control in the photography of coloured objects.

The filters constructed were of the ordinary type, each consisting of two glass plates flowed with coloured gelatine, and, when dry, cemented together with balsam. The factors determining the selective absorption are the strength and dye content of the gelatine solution and the volume flowed per unit area. The flowing solution consisted in each case of 6 per cent. by weight of clarified gelatine, a definite quantity of one or more aqueous dye solutions, and distilled water to make the whole up to 100 per cent. Any filter is thus fully determined by giving for each of its two components (1) the dye used and the strength of aqueous stock solution, (2) the quantity of this dye solution used in 100 parts of the final mixture, and (3) the quantity flowed on unit area. The gelatine solution is filtered and poured while still warm on the previously cleaned and levelled glass plates.

The action of the filters is shown by photographs of their absorption spectra. It is possible, however, to indicate the characteristics

Filter.	Formula. Dye Solution.	Quan'ty.	Coating.	Plate.	Limits of Action. Microns.
		c.c.	c.c.		
110	*a* Rhodamine B 1% ..	85	0.094	Pan.	.60–.71
	b Orange G 1%* ..	50	.125		
103	*a* Rose Bengal 0.5%	13.6	.094	Pan.	.58–.71
	b Orange G 1%* ..	50	.125		
12	*a* Erythrosine 0.5% ..	20	.094	Pan.	.57–.71
	b Orange G 1%* ..	50	.125		
5	*a* Ponceau 2R 1% ..	15	.094	Pan.	.56–.71
	b Auramine 0.5% ..	20	.094		
4	*a* Ponceau 2R 1% ..	12	.094	Pan.	.55–.71
	b Orange G 1%* ..	20	.094		
115	*a* Fluoresceine 0.5%*	94	.156	Pan.	.54–.71
	b Picric acid 0.5% ..	33	.094		
113	*a* Ponceau 2R 1% ..	5	.094	Pan.	.54–.71
	b Metanil yellow 0.5%	16	.125		
13	*a* Naphthol green 0.5%	12	.094	Pan.	.48–.62
	Brilliant green 0.5%	2			
	b Picric acid 0.5% ..	30	.125		
	Napthhol yellow sat. sol.	50			
8	*a* Naphthol green 0.5%	6	.094	Pan.	.48–.62
	Brilliant green 0.5%	3			
	b Picric acid 0.5% ..	94	.125		
7	*a* Methylene green 1%	15	.125	Pan.	.47–.62, slight action.
	b Auramine 0.5% ..	20	.094		.66–.71
121	*a* Picric acid 0.5% ..	30	.125	Ortho.	.46–.63
	Naphthol yellow sat. sol.	50			
	b Uncoated glass ..				
17	*a* Naphthol yellow sat. sol.	50	.125	Ortho.	.47–.63
	b Naphthol yellow sat. sol.	50	.125		
14	*a* Nacht blau 1% ..	15	.094	Pan.	.40–.49
	b Gentian violet 0.5%	10	.094		
10	*a* Methylene green 0.5%	15	.125	Pan.	.37–.49
	b Gentian violet 0.5%	20	.094		
11	*a* Iodine green 1% ..	10	.094	Pan.	.35–.51
	b Gentian violet 0.5%	10	.078		
119	*a* Picric acid 0.5% ..	5	.078	Ord.	.39–.50
	b Erythrosine 0.5% ..	20	.094		
123	*a* Aesculin 1% ..	5	.094	Ord.	.39–.50
	b Erythrosine 0.5% ..	15	.094		
118	*a* Aesculin 1% ..	5	.094	Ord.	.39–.52
	b Uncoated glass ..				
20	*a* Orange G 1%* ..	23	.094	Pan.	.53–.70
	b Naphthol yellow sat. sol.	50	.094		
19	*a* Orange G 1%* ..	8	.094	Pan.	.52–.70
	b Naphthol yellow sat. sol.	50	.094		
17	*a* Naphthol yellow sat. sol.	50	.125	Pan.	.49–.70
	b Naphthol yellow sat. sol.	50	.125		
121	*a* Picric acid 0.5% ..	30	.125	Pan.	.47–.70
	Naphthol yellow sat. sol.	50			
	b Uncoated glass ..				
122	*a* Aesculin 1% ..	15	.125	Pan.	.42–.70
	b Naphthol yellow sat. sol.	50	.078		
118	*a* Aesculin 1% ..	5	.094	Pan.	.39–.70
	b Uncoated glass ..				
16	*a* Naphthol yellow sat. sol.	50	.062	Pan.	.35–.70, max. .56
	b Uncoated glass ..				
18	*a* Orange G 1%* ..	1.5	.094	Pan.	.40–.70, max. .56
	b Naphthol yellow sat. sol.	50	.062		
23	*a* Gentian violet 0.5%	10	.094	Pan.	.64–.71
	b Orange G 1%* ..	50	.125		
101	*a* Naphthol green 0.5%	20	.125	Pan.	.59–.65
	Orange G 1%* ..	50			
	b Erythrosine 0.5%	94	.125		
104	*a* Fluoresceine 0.5%*	94	.125	Ortho.	.54–.61
	b Picric acid 0.5% ..	33	.094		
20	*a* Orange G 1%* ..	23	.094	Ortho.	.52–.61
	b Naphthol yellow sat. sol.	50	.094		
17	*a* Naphthol yellow sat. sol.	50	.125	Ord.	.47–.53
	b Naphthol yellow sat. sol.	50	.125		
107	*a* Nacht blau 1% ..	20	.094	Pan.	.46–.51
	b Picric acid 0.5% ..	33	.078		
106	*a* Rose Bengal 0.5%	16	.125	Ord.	.46–.50
	b Picric acid 0.5% ..	33	.078		
111	*a* Picric acid 0.5% ..	33	.094	Pan.	.46–.48
	Erythrosine 0.5% ..	20			
	b Nacht blau 1% ..	20	.094		
108	*a* Eosine yellowish 1%	14	.094	Ord.	.42–.47
	b Aesculin 1% ..	15	.125		
22	*a* Eosine yellowish 1%	14	.094	Ord.	.37–.45
	b Eosine yellowish 1%	14	.094		
106	*a* Rose Bengal 0.5%	16	.125	Pan.	.46–.50, .59–.71
	b Picric acid 0.5% ..	33	.078		
123	*a* Erythrosine 0.5% ..	15	.094	Pan.	.39–.51, .55–.71
	b Aesculin 1% ..	5	.094		
119	*a* Picric acid 0.5% ..	5	.078	Pan.	.39–.48, .56–.71
	b Erythrosine 0.5% ..	20	.094		
108	*a* Eosine yellowish 1%	14	.094	Pan.	.42–.47, .56–.71
	b Aesculin 1% ..	15	.125		
22	*a* Eosine yellowish 1%	14	.094	Pan.	.38–.45, .56–.71
	b Eosine yellowish 1%	14	.094		

* Orange G and fluoresceine will not dissolve in water in the proportion stated. Ammonium hydroxide is added drop by drop until solution occurs.

approximately by giving the limits of action in the spectrum. Such an attempt is made in the accompanying table in connection with sufficient data for exact reproduction.

In choosing filters for any specific purpose, it should be noted that the action obtained is limited by the sensitiveness of the photographic plate used and the character of the light-source. Due allowance must be made for these factors. The following data refers to absorption spectra for which the light-source was an incandescent tungsten filament in a gas-filled bulb of light blue colour. This lamp is supposed to produce an approximation to daylight, and is commercially known as "Mazda C 2." The spectrum of this source on the brand of panchromatic plate used is continuous from about 0.35 μ to 0.72 μ. A region of less action exists at about 0.52 μ. The ordinary plates, not colour sensitised, showed action without filter from 0.35 μ to 0.55 μ. In the case of the orthochromatic plates the action was extended to about 0.63 μ.

The first group listed is a series of red filters differing principally in the position of the limit of absorption toward the blue. While origionally intended for three-colour work there are many other uses for which such filters are suitable.

The next two groups comprise green and blue three-colour filters of various characteristics. Among these are certain yellow and negative green filters giving with ordinary or orthochromatic plates a range of action desirable in the blue and green sensation negatives in three-colour work.

The series of orange and yellow contrast filters is in effect a continuation of the red series, absorbing decreasing amounts of the blue and violet. Two, Nos. 16 and 18, show an approach to the distribution of visual intensity.

The fifth group comprise filters which of themselves, or when combined with the limited sensitiveness of ordinary or orthochromatic plates restrict the action to relatively narrow limits.

The last five filters, previously listed for use with ordinary or orthochromatic plates, are here used as negative green filters with panchromatic plates.

For each component part of each filter, indicated as "*a*" and "*b*," there are given (1) the name of the dye used and the concentration of the aqueous stock solution, (2) the quantity of stock dye solution used for each 100 c.c. of the final mixture, and (3) the volume of coating solution for each sq. cm. area. In addition to the dye solutions, each coating mixture contains 6 per cent. by weight of gelatine and distilled water to make 100 per cent.

CHARLES D. HODGMAN

FORTHCOMING EXHIBITIONS.

1922.

January 11 to 27.—Camera Portraits, entitled "Men of Mark," by Walter Stoneman, at the house of the Royal Photographic Society, 35, Russell Square, London, W.C.1.

January 21 to February 4.—Partick Camera Club. Particulars from the Hon. Secretary, James Whyte, 51a, Peel Street, Partick, Glasgow.

February 7 to 11.—Sheffield Photographic Society. Latest date for entries, January 21. Particulars from the Hon. Secretary, James R. Wigfull, 14, Parade Chambers, Sheffield

February 11 to 25.—Scottish Photographic Salon. Latest dates, entry forms, January 23; exhibits, January 31. Particulars from the Secretary, James F. Smellie, Braefindon, Allanshaw Street, Hamilton.

February 14 to 17.—Exeter Camera Club. Latest date for entries, January 30. Particulars from C. Beauchamp Hall, Hon. Exhibition Secretary, Exeter Camera Club, "St. Denys," Bellevue Road, Exmouth.

February 18 to March 4.—Edinburgh Photographic Society. Latest dates, entry forms, February 4; exhibits, February 9. Particulars from the Hon. Secretary, G. Massie, 10, Hart Street, Edinburgh.

March 4 to 25.—South London Photographic Society. Particulars from the Hon. Secretary, Harry Abbott, 61, Beauval Road, East Dulwich, London, S.E.22.

March 8 to 9.—Birkenhead Photographic Association. Latest date for entries, February 25. Particulars from the Exhibition Secretaries, Messrs. Longstaff and Trace, 33, Hamilton Square, Birkenhead.

March 28 to April 1.—Hackney Photographic Society. Hon. Secretary, Walter Selfe, 24, Pembury Road, Clapton, London, E.5.

April 5 to 8.—Leicester and Leicestershire Photographic Society. Particulars from the Hon. Secretary, W. Bailey, Cank Street, Leicester.

May 1 to 6.—Photographic Fair. Horticultural Hall, Westminster. Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1.

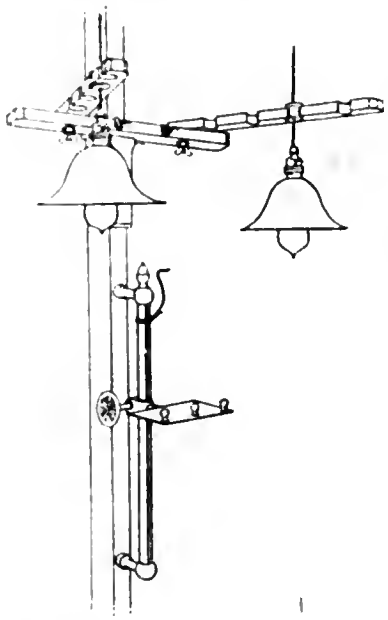
September 18 to October 28.—Royal Photographic Society. Latest date for entries by carrier, August 25. Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

A Mechanical Device for Use in Copying Framed Subjects.

THE copying of photographs and various subjects, requiring to be reproduced in the studio, is frequently done through the glass of a frame; most work being in a better condition for copying, under pressure behind the glass. Such subjects thus need more room for adjustment to the lens than is generally afforded by the ordinary copying easel, so that it becomes necessary to fix them up before the camera in some other way. I have found the method shown in the drawing to answer the purpose well. The means of artificial lighting when required will perhaps easily be seen. I have utilised a post for support which occupies a convenient position for day lighting, and the two wooden movable arms work on a piece which is clamped to the post, and can be raised or lowered; the lamps have also weighted suspenders, and work up and down, the lights,



of course, being shaded from the lens. But the most novel feature of the method is the mechanical device used for supporting the framed pictures, etc., for copying, and this, though a rather elaborate bit of machinery, worked out by a handyman with engineering experience, proves itself worthy of its "post." It is bolted to the same upright post, the platform upon which the picture stands being connected with a clamping collar, and made to work smoothly up and down the upright iron bar, and clamped by a screw at the back, to the required elevation, by a turn of the wheel. It is easy to adjust, and the strength of grip makes a safe support for a fairly heavy weight. A wire twist working up and down the upright bar serves to steady, or sometimes to hook, the frame in an upright position. The groove seen in front of the upright bar engages with a ridge inside the collar, and retains the platform in a frontal position. The camera is fixed to a table which runs to and fro on castors.—M. B.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, December 19 to 24 :—

TRIPODS.—No. 34,541. Tripod stands for photographic, etc., apparatus W. M. Gillard.

APPARATUS.—No 34,272. Apparatus for treatment of strips of photographic film. F. J. M. Hansen.

PROJECTION APPARATUS.—No 34,364. Apparatus for photographic lantern-slide projection. A. N. Wight.

CINEMATOGRAPHY.—No. 34,520 Method of treating cinematograph films to eliminate scratches, etc. A. F. M. Ott.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1s. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

THREE-COLOUR CAMERAS.—No. 164,476 (March 6, 1920). The invention consists of a camera in which three plates are successively exposed through filters connected in turn with the optical system so as to vary the effective aperture of the filters relative to one another for maintaining a constant time of exposure through each filter.—Arthur Renald Twist, Coronation House, 4, Lloyds Avenue, London. [Further particulars of the invention are given on another page in the "Colour Photography" Supplement.]

TWO-COLOUR PHOTOGRAPHY.—No. 169,533 (June 30, 1920). The main claim is for a process of colour photography which consists in preparing two negative-records, one of which is a record mainly of the green constituents of the object, and the other is a record mainly of the red constituents, preparing positives therefrom and colouring the image of the positive of the green record negative magenta or minus green and the image of the positive of the red record negative blue-green or minus red, preparing a third positive by printing from the two negative-records combined and superimposed in register, colouring the image of the third positive yellow, and combining the three-colour positives in register.—John Frederick Shepherd, 10, Derwentwater Road, Acton, London, W.3, and Colour Photography, Ltd., 3, St. James's Street, London, S.W.1. (Particulars of the process are given on another page in the "Colour Photography" Supplement.)

PRINTING FRAMES.—No. 168,728 (July 2, 1920). The invention refers to photographic printing frames of the type having the back made in two parts each provided with the separate spring clamping device and one of which parts is intended to be unclamped and raised for viewing the print during the progress of the printing operation while the other part remains clamped in position. In such printing frames it has been proposed in Patent Specification No. 3,648 of 1904 to provide means in conjunction with the last-named part of the back to lock or anchor the part against the adjoining end rail of the printing frame by means of a hook pivoted either on the surface of the back or on the adjoining end rail of the frame to engage with a stud fixed either on the back or fixed on adjoining end rail, the hook to be so formed that its curved portion is eccentric with its working centre so that it clamps the part of the back against the adjoining end rail.

The invention consists in forming a hook or slotted member integral with or fixedly attached to the spring clamping device and at or about right angles thereto, the hook being adapted to engage with a pin or stud mounted on the adjoining end rail of the printing frame, and providing a cam or eccentric surface on either (*a*) the operative edge of the hook or (*b*) on the pin, in which latter event means are provided on the pin to impart a partial rotation to the latter after the hook has been forced into engagement with the pin; and thus locking or anchoring means are so combined with the clamping device and the parts so constructed and arranged to act that when the clamping device on the last-named part of the back is operated the anchoring or locking means are simultaneously brought into engagement and either (*a*) automatically locked or (*b*) locked by turning the pin whereby the part of the back is simultaneously (1) clamped against the print, etc., in the frame and (2) anchored or locked fixedly against end rail of the frame.

In the drawings, the detachable back of the photographic printing frame 2 is formed in two parts 1 and 1^a hinged together and is shown provided with the well-known centrally pivoted clamping springs 3, 4. In order to prevent the clamped portion 1 of the hinged back from slipping, while the portion 1^a, after being unclamped is raised for inspecting the print, means are provided

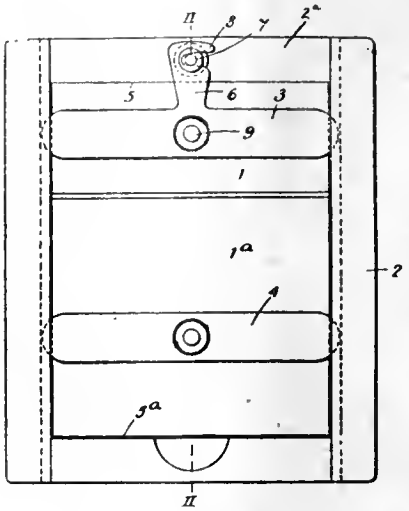


Fig. 1.

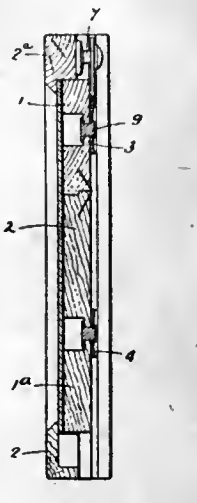


Fig. 2.

for holding the transverse edge 5 of the clamped portion 1 of the hinged back tightly and securely clamped to the adjacent corresponding edge of the end rail 2^a of the frame 2. Such a clamping movement may, as shown in figs. 1 and 2, be attained by a single cam device centrally located with respect to the width of the frame.

The cam device illustrated comprises a pivoted hook member 6 engaging with a fixed abutment or pin 7, *i.e.*, fixed on the rail of the frame; and the drawing, wedging or clamping movement is effected by providing the hook 6 with a cam drawing edge 8 for engagement with the pin 7. In operation, the number of movements of the hand is reduced by reason of the hook 6 being integral with the clamping spring 3, the hook and spring being conveniently stamped in one piece, so that both revolve about the same pivot 9. With this construction the transverse edge 5 of the portion 1 of the detachable back will be automatically drawn into close contact with the corresponding edge of the end rail 2^a of the frame 2, and securely retained in that position in conjunction with the frictional resistance or pressure set up by the clamping spring 3, by the usual movement of the clamping spring 3 when closing the frame 2.

As shown in figs. 3 and 4, the wedging or cam surface instead of being provided on the hook or slotted member is formed on the abutment. The hook 6^a is provided with an edge 8^a adapted to engage with a cam surface 10 on a bolt or pin 11 which latter is

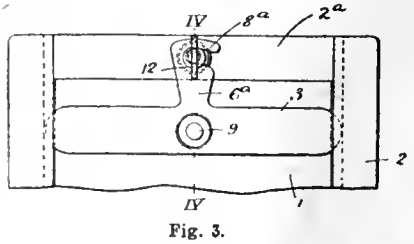


Fig. 3.

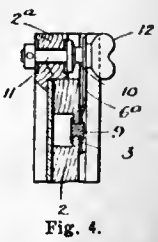


Fig. 4.

suitably mounted in the end rail 2^a of the frame 2 so as to be capable of rotation by means, for instance, of a cross-head 12.

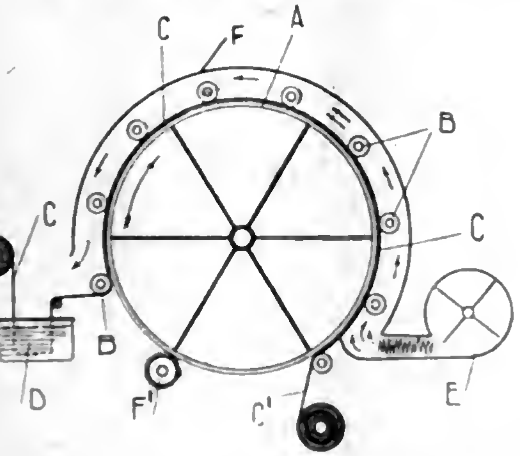
In operation the spring clamp 3 and hook 6^a would be first moved into the position shown, and the pin 11 is then partially rotated so as to cause the cam surface 10 to draw the hook 6^a and thereby the back portion 1.—Houghton-Butcher Manufacturing Co., Ltd., Clifford Road, Walthamstow, London, E.17, and Alfred Joseph Dennis, The Langdales, Connaught Avenue, Chingford, Essex.

Print-Glazing Machines.—No. 165,158 (March 16, 1920). The apparatus comprises a polished rotary drum, preferably of steel, over which the paper to be treated is fed, preferably from a continuous coil, the paper being previously moistened. The paper is pressed into contact with the surface of the drum by means of pressure rollers and a heating arrangement is provided which transmits heat over the external surface of the paper on the drum.

The heat is preferably greatest at or about the point where the paper leaves the drum, the heat being regulated to prevent injury to the gelatine surface of the paper.

A suitably driven rotary brush may be provided in contact with a free portion of the surface of the drum to keep the drum surface constantly polished.

In the drawing, A is a polished steel drum of a breadth slightly wider than the paper to be treated, the drum being



mounted upon its horizontal axis. A series of rubber pressure rollers B are arranged in contact with the outer surface of the drum so that they are rotated about their horizontal axes by the drum.

The paper to be polished is arranged in a coil C, passing through a water trough D guided by suitable rollers, and thence under the rollers B, being led off the drum and coiled up again at C^1. A casing F is arranged around the portion of the drum over which the paper passes and a heating arrangement and a fan blower E are arranged in the casing at the point where the paper leaves the drum. A high speed rotating brush F^1 is arranged in contact with the under side of the drum to keep the surface continually polished.

In operating, the drum is slowly rotated in a clockwise direction and the fan E and heater are operated to drive a strongly heated current of air through the casing.—Asmo Catini, 30, Via Roma, Turin.

The following complete specifications are open to public inspection before acceptance:—

Focussing-Devices.—No. 172,974. Focussing devices for photographic apparatus. J. Krone.

Trade Names and Marks.

MARKS PLACED ON THE REGISTER.

The following marks have been placed on the register.—

Iko.—No. 418,223. Photographic paper, photographic albums, and photographic mounts included in Class 39. Ilford, Ltd., Britannia Works, Roden Street, Ilford, Essex, manufacturers of photographic plates, paper and films.

A Lithographic Pioneer. The death has taken place in the Edinburgh district of Mr. Lachlan Sinclair, at the age of ninety-one. He was for sixty-eight years in the employ of Messrs. Nelson and Co.'s Publications, being one of the pioneers of the three-colour process.

New Books.

Converting a Business into a Private Company.—A handy little volume of this title has been written by Mr. Herbert W. Jordan, of the well-known firm of registration agents of Chancery Lane, London, W.C.2, price 1s. net. It tells in simple language the advantages which are obtainable from the conversion of a business into a private registered company, and explains the procedure and cost of carrying out the necessary conversion.

The Scientists' Reference Book and Diary.—This annual pocket reference volume published by Mesrs. James Woolley, Sons & Co., Ltd., Manchester, price 3s. 6d. net, appears for the year 1922 with its customary numerous pages of scientific facts of daily service to the chemist or physicist. It contains particulars of the Universities, learned societies, and other institutions, in addition to a diary for the year and postal and other general information.

Physics and Chemistry of Colloids.—The report of a general discussion held jointly by the Faraday Society and the Physical Society of London on the physics and chemistry of colloids in relation to various branches of manufacture has been published by H.M. Stationery Office for the Department of Scientific and Industrial Research, price 2s. 6d. net. The volume contains a large number of papers on the properties of colloid substances and processes. While the particular application of colloid chemistry to the making of photographic emulsions does not come within the scope of the discussions there is much in the papers on the properties of jellies and other colloid preparations which is of interest to experimenters in the processes of emulsion photography.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Sunday, January 8.

United Stereoscopic Society. "The Charm of the Village Church." F. G. Ender.

Monday, January 9.

Bradford P.S. "Colour Photography." C. B. Howdill.
City of London and Cripplegate P.S. Print Competition.
Dewsbury Photographic Society. Annual Meeting.
Kidderminster P.S. Midland Photographic Federation Folio.
Leeds Camera Club. "An Old Garden." Alex. Keighley.
Southampton Camera Club. Annual General Meeting.
South Shields P.S. "Intensification and Reduction." By Members.
Wallasey Amat. P.S. "Shutter Testing by Arc Light."
Walthamstow and Dist. P.S. "Portraiture." W. H. Reece.

Tuesday, January 10.

R.P.S. (1) "Should the Manufacturers supply figures indicating the contrast grading of Gas-light and Bromide Papers?" Discussion to be opened by Dr. B. T. J. Glover. (2) Demonstration of some effects with Ultra-violet Light. A. F. Kitching. (3) The General Electric Co., Ltd.: "Demonstration of a new type of Projection Lamp." J. A. Marriott.
Belfast C.P.A. Camera Club. "Panchromatism." J. R. Bainbridge, M.Sc.
Birmingham Phot. Soc. Concert.
Cambridge Photographic Club. "Wireless Telegraphy."
Exeter C.C. "Amateur Photographer" Prize Slides.
Hackney P.S. "Developers and Development." G. C. Weston.
Morley Phot. Soc. "Lenses: how they are made and their uses." R. Spencer.
Nelson Phot. Soc. Lancashire and Cheshire Union Slides and Prints.
South Glasgow C.C. Lantern Slide Monthly Competition.
Stalybridge P.S. "The English Lake District." C. H. Moore.
Tyneside P.S. "Inserting Clouds." W. F. T. Pinkney.
Welfare Camera Club. Annual General Meeting.

Wednesday, January 11.

Accrington Camera Club. "Through the Grecian Archipelago." H. W. Dunbary.
Birkenhead Phot. Assn. "Pinhole Photography." J. Riding.
Borough Polytechnic P.S. "Defects and their Remedies." E. D. [illegible]
Croydon Camera Club. "The Rapidity of a Lens." E. A. Salt and A. J. [illegible]
[illegible] Amateur Phot. Assoc. "How a Reflex Camera is Made." W. Butcher & Sons.

Forest Hill P.S. "Intensification and Reduction." J. H. Sinclair.
Halifax Scientific Society. Y.P.U. Lantern Slides.
Ilford P.S. "Mont St. Michel." H. W. Fincham.
Partick C.C. Second Lantern Slide Competition.
Photo-micrographic Society. "Crystallisation in Metals." Dr. B. P. Haigh.
Rochdale Amateur P.S. "Seltona" Demonstration. W. Lord.
South Suburban P.S. "Trick Photography." P. R. Salmon.

THURSDAY, JANUARY 12.

Gateshead C.C. "Old Methods and New." W. F. Slater.
Hammersmith Hampshire House P.S. "May-Time at Lake Geneva." W. Sanderson.
Optical Society. "The Manufacture of Optical Glass." Dr. C. J. Peddle.
Wimbledon and Dist. C.C. "Famous British Pictures." Henry Hudson.

FRIDAY, JANUARY 13.

Wombwell P.S. Beginners' Night. Lantern Slide Making.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, January 3, the president, Dr. G. H. Rodman, in the chair.

Mr. W. F. A Ermen, M.A., read a paper "On the Conditions Affecting the Apparent Activity of some Organic Developers."

Mr. Ermen had begun a series of experiments with the object of finding some numerical measure of the "activity" of a developer, and of establishing some means of predicting the properties of a developer from the constitutional formula. An account of the many results obtained is not possible in the absence of the curves and tables embodying them, but it can be said that the bases of comparison were the maximum density produced in a given time of development, the depression in density due to bromide and the time of appearance of the image. From these results he was able to place developers approximately in an order of activity. He also described results of experiments on the effect of variation of soda carbonate on the activity of a developer, in the course of which a good many observations were made on the action of developers used without alkali. In conclusion he referred to the effect of desensitiser on the behaviour of developers.

A discussion followed, in which Messrs. R. E. Crowther, F. F. Renwick, G. E. Brown, C. M. Thomas, and E. W. Mellor took part, and on the proposition of the chairman a cordial vote of thanks was accorded to the lecturer.

Commercial & Legal Intelligence.

NEW COMPANIES.

AVERYS SERVICES, LTD.—This private company was registered on December 20 with a capital of £4,000 in £1 shares (1,000 preference and 3,000 ordinary). Objects: To adopt an agreement with A. A. W. Avery and to carry on the business of photo, colour, half-tone, and line process engravers, photo-etchers, artists, photo-printers, photographers, retouchers, photo-offset plate makers, and printers, etc. The subscribers (each with 100 preference shares) are:—F. Avery, 6, Bristol Road, Stratford, E.15, photographer; J. R. Avery, 6, Bristol Road, Stratford, E.15, draughtsman. The first directors are: A. A. W. Avery (permanent managing director), F. Avery, J. R. Avery, and Margaret E. M. Avery. Qualification, £100. Remuneration £50 each per annum.

UNDOCHROME, LTD.—This company was registered on December 15, with a capital of £5,000 in 4,750 10 per cent. preferred ordinary shares of £1 each and 5,000 deferred ordinary shares of 1s. each. Objects: To acquire and turn to account any inventions, patents and processes relating to photography or cinematography. The first directors are:—A. Martin, L15. Halton Mansions, N.1; G. G. Hacker, 9, The Parade, S.E.11; T. P. Middleton, Briarwood, Lower Bourne, Farnham (managing director). Minimum cash subscription, 100 shares. Qualification, 100 shares. Remuneration (except managing director), £100 each per annum (chairman £150). Registered office: 49, Devonshire Chambers, 146, Bishopsgate, E.C.

PRESLANDS, LTD.—This private company was registered on December 21, with a capital of £1,515 in 1,500 cumulative 7½ per cent. preference shares of £1 each and 300 ordinary shares of 1s. each. Objects: To carry on the business of printers, stationers, lithographers, typefounders, photographic printers and lithographers, artists, engravers, etc. The first directors are:—H. F. L. Williams (life director), 20, York Buildings, Adelphi; G. T. Thomas, 40, Leinster Gardens, Hyde Park; J. H. Skelton, Royal London House, Finsbury Square, E.C.2. Registered office: 7, Southampton Street Holborn, W.C.1.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION OF GREAT BRITAIN AND IRELAND, LTD.—This company was registered on December 19, as a company limited by guarantee. Objects: To promote the interests of members and associated members in their professional work; to watch parliamentary or public action affecting the interests of photographers; to deal with matters affecting professional custom and practice; to procure from insurance companies advantageous terms for members against business risks, etc. The management is vested in a council, the first members of which are:—H. G. Chase, 53, Widmore Road, Bromley Kent; C. F. Dickinson, 1, Myton Road, Dulwich, S.E.; A. Ellie, 2, Vinery Villas, Hanover Gate, N.W.; G. Hana, 22, Bedford Street, Strand, W.C.; A. Bennett, 56, Eagle Street, Southampton Row, W.C.; R. Haines, 4, Southampton Row, W.C.; F. Brown, The Limes, London Road, Leicester; T. Chidley, 14, Werburgh Street, Chester; W. Illingworth, 110, Abingdon Street, Northampton; F. Read, 97, Renshaw Street, Liverpool; H. C. Spink, 109, Western Road, Brighton; T. C. Turner, Regent House, Anlaby Road, Hull; A. S. Watson, View Park Studios, Bruntsfield Links, Edinburgh; H. Lambert, 32, Milson Street, Bath; A. Corbett, 48, Baker Street, W.; A. B. Brown, 100, Tottenham Court Road, W.; W. E. Gray, 92, Queen's Road, Bayswater, W.; R. N. Speaight, 157, New Bond Street, W.; F. Wakefield, 64, High Road, Chiswick; H. A. L. Chapman, 235, High Street, Swansea; W. H O. Wedlake, 358, Romford Road, Forest Gate; H. D. Wheeler, 9, Church Street, Folkestone; M. Adams, 43, Dover Street, W.; H. G. St. George, 112, Albany Street, W.; W. B. Chapman, 13, High Street, Windsor. Registered office: 9, Old Jewry Chambers, E.C.

News and Notes.

MESSRS. THOMAS ILLINGWORTH & Co. have issued an attractive calendar for 1922 embodying the firm's well-known horseshoe trade mark, and forming a striking piece of advertisement for Illingworth plates and papers.

R.P.S. FELLOWSHIP.—The following have been elected Fellows of the Royal Photographic Society:—Edgar R. Bull, Robert Chalmers, Francis Orville Libby, W. J. Smith, E. L. Turner, and Colin M. Williamson.

CARBRO DEMONSTRATIONS.—The Autotype Company have arranged to give a series of demonstrations of their Carbro process at their offices, 74, New Oxford Street, London, W.C.1, every Thursday afternoon during the present month between 3 and 5 o'clock. Any photographers will be welcome.

KODAK'S WINDOW-DRESSING PRIZE.—Over eleven hundred shops in London and the South of England entered the "Evening News" competition, in which cash prizes were given for windows typifying the Christmas spirit. A prize of £5 was won by the Oxford Street branch of Kodak, Ltd., whose photographic display secured 1,035 votes from the public.

SHEFFIELD PHOTOGRAPHIC EXHIBITION.—The exhibition arranged by the Sheffield Photographic Society will be held from February 7 to 11. There are two open classes, one for prints and colour transparencies, and the other for lantern slides. Mr. Bertram Cox will judge the entries, the last day for the receipt of which is January 21. Prospectus and entry form from Mr. J. R. Wigfull, 14, Parade Chambers, Sheffield.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—The annual exhibition will be held at the South London Art Gallery from March 4 to March 25 Mr. Bertram Cox will be the judge in the three open

classes (pictorial photography, lantern slides, and technical and scientific photographs), and in the numerous members' classes. Particulars and prospectus are obtainable on application to Mr. Harry Abbott, 51, Beauval Road, East Dulwich, S.E.22.

THE CLUB PHOTOGRAPHER.—Contributions by members of the Birkenhead Photographic Association are made the feature of the January issue of the "Club Photographer." Among them is a variety of the Bromoil process, described by Mr. A. Shipley as "Oilograph," and specially suitable for transfer of the inked up impression. The "Club Photographer" is obtainable, 4½d., post free, from Messrs. Tutills, Ltd., 9, Swan Street, Manchester.

PHOTOGRAPHING STREETS FROM CAGES.—The large number of motor-car accidents in Paris (there were no fewer than 135 on a recent Sunday) have aroused the officials, and a few days ago the Paris police traffic squad were informed that for ten days a number of them would be installed in high-perched cages over leading thoroughfares. They will not only direct the traffic (said the official notice), but photograph motor-cars travelling to the danger of the public, thus securing unmistakable proof of the offenders' identity.

THE SERVICE COMPANY.—The directors report that the trading for the year ended September 30, 1921, has shown a net profit of £7,237 12s. 5d. Adding the balance brought forward from the previous year and deducting the interim dividend paid on the 6 per cent. cumulative preference and preferred ordinary shares, there is a balance of £7,792 13s. 7d. for disposal. After making full provision for bad debts, repairs and renewals, depreciation of premises, furniture, etc., and allotting £791 3s. 3d. to the employees' bonus fund, the directors recommend payment of (*a*) the full dividend on the 6 per cent. cumulative preference shares; (*b*) the maximum dividend of 10 per cent. on the preferred ordinary shares; (*c*) a dividend of 12 per cent. on the ordinary shares, placing £2,500 to reserve, thus increasing the reserve fund to £11,000. The balance of £3,359 2s. 8d. is carried forward to next year's accounts.

HOW A PHOTOGRAPHER BROUGHT BUSINESS.—A few days ago we heard of one method of advertising used by a photographer, which could be profitably used in your town, says an exchange. It is quite generally the custom, especially in high schools, for certain classes to make trips through different business houses and factories where the students can learn how business is carried on and how various things are manufactured. The photographer of whom we are speaking heard of this, and invited the principal of the local high school to bring classes through the studio to see how pictures are made. The school took advantage of his offer and the photographer explained everything. His apparatus could not fail to impress these coming citizens with the fact that photography was the business of skilled workmen, and that making pictures was far more than just pressing a bulb. The value of this demonstration, besides general advertising, was found in the fact that many of these students were interested enough in photography to come in later and have their pictures made.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

To the Editors.

Gentlemen,—In to-day's issue of your publication I note that in the report of the meeting of the Professional Photographers' Association held on December 9, Mr. Speaight states that it is gratifying to note that none of the resigning members found any fault with the Association.

May I say that I think this was a result of their restraint, and not because there were no faults to find. I have been a member for several years now, but living outside London I have had no benefit beyond the little "Circular" the Association used to publish and the privilege of attending the Congress (on payment of 10s. or so extra). Then recently the subscription was raised, but to balance this the little "Circular" has apparently been dropped, and a small page in a dealer's leaflet is all we get.

I wrote some time ago suggesting that the "Circular" should add to its previous information a review of all the new apparatus and gadgets that were put on the market, together with details of prices, etc., for the benefit of those members who did not live in London and could not spare time to run up to town often to keep *au fait* with the latest innovations. The secretary replied that he thought this a good idea and would bring it up at an early meeting. The result appears to have been the exact opposite. The firm which grants a page per month to the P.P.A. in their trade bulletin is, I grant, a very good firm, but we don't want our journal to be published by any firm interested in the trade. We want an unbiassed review of goods equal alike to all manufacturers.

And now to crown all the P.P.A. have decided to hold their Congress, the only remaining event now of any interest to provincial photographers, in September, and apart from the Photographic Fair.

Now do the Council realise that for a large number of their members September is out of the question as a month for them to leave their studios and go up to town for a week? All the seaside place at least are at the height of their best class season. April or May are slack months in most towns, and if Londoners object that it is *their* season, then let them remember that they live on the spot, and can slip out to the Congress for a few hours at a time or in the evening, but the provincial photographer cannot. He has to leave his business to the mercies of his staff for several days at least.

Can you wonder at the large number of resignations (134 according to the report) in face of these facts?

When the Association realises that the majority of its members are *outside* London, and tries to keep *their interest* sustained by a decent journal, a Congress in various towns besides London, and, if possible, by establishing district centres that could *do something*, then I can see their membership going up in leaps and bounds. At present they are simply committing suicide as an Association. I have written this not so much for the sake of grumbling as to try and rouse some life, if only by-an argument.—Yours truly,

H. L. KETTLE.

18, Ramshill Road, Scarborough,
December 23, 1921.

PETROL MANTLE LAMPS IN STUDIO PORTRAITURE.

To the Editors.

Gentlemen,—As I notice there are frequent inquiries in your columns respecting artificial illuminants for portraiture, I thought it may possibly be of interest to some of your readers, who, like myself, live in a place where no electric current is available, and who perhaps object to the great heat generated when using a number of burners for ordinary gas, to know that I have recently been experimenting with petrol lamps in this direction. There are doubtless many types of these lamps on the market, the particular ones I have tried are Zenda lamps, made by the Kitson-Empiro Lighting Co., of Stamford.

There are two lamps, carrying inverted mantles, and run from a cylinder of petrol placed on the floor, the lamps being connected with it by flexible copper tubing. In my own case I fitted reflectors, and hung the lamps on two iron rods attached to the ceiling in such a manner that they could slide along them, and also they were attached to a joint enabling them to be turned in different direction. It is of course necessary to light this type of lamp, by first igniting some methylated spirit, which has previously been poured into a trough provided in the lamp. After this has burned for a minute or so will have heated the burner sufficiently to allow the petrol to ignite the mantle when turned on from cylinder. The lamps are, I think, rated at approximately 800 c.p. each, and they give a light of beautiful soft quality. Using a lens of *f* 3, with 500 H. & D. plate I can obtain an exposure in one second, without the lamps being uncomfortably near the subject.

More lamps could, I understand, be run from the one cylinder if necessary.

I enclose a few proofs, from unretouched negatives, taken in the circumstances described.—Yours truly,

R. PERKINS.

Hill Road, Clevedon.
December 23, 1921.

[We are much obliged to our correspondent, whose prints show full exposure and remarkably good illumination in the shadows.—EDS., B.J.]

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

H. H. H.—We believe all the three books you name are out of print, but they are by no means rare, and we have no doubt you could obtain second-hand copies from Messrs. W. and G. Foyle, Ltd., 121-123, Charing Cross Road, London, W.C.2.

C. H. TOMS.—Messrs. Houghtons, 88-89, High Holborn, London, W.C.1, are agents in this country for the "Photo-Miniature" series of monographs, the price of which is 1s. 8d. each post free. Issues which they may not be able to supply would perhaps be obtainable from the American publishers at 103, Park Avenue, New York.

J. H.—Two gas lights would be quite useless; at least a dozen are necessary if you want to give reasonably short exposures. It will therefore be better to rely entirely upon daylight. Have a dark blind over the lower part of the window up to 4½ ft. from the floor. Use a large white reflector on the shadow side, but do not place it too close to the sitter.

J. W.—(1) If of very pale colour a blue, green, or possibly a yellow glass might be used for modifying contrast, but for practical purposes the method is practically useless in comparison with the use of a suitable printing paper, or intensification or reduction of the negative. (2) A photograph obtained in the circumstances you mention is the copyright of the person who took it, and we know of no ground on which he could be restrained from making any commercial use of it.

A. B. C.—We are much obliged to you for your comments. Really there is no secret in making the index to the "B.J." except week-by-week supervision of its assemblage in slip form. The "copy" for the index is sent to the printers while two issues of the volume remain to be published; the entries relating to the subject-matter in these two issues are added to the proofs. A practical manual of the subject is "Indexing," published by Messrs. Grafton's, 7, Coptic Street, London, W.C., 7s. 6d. net.

CARDI.—For bromide printing, unless the negatives are of exceptional density, a 32 c.p. metal filament lamp is ample power. It should be fitted in the printing box so that the filaments run roughly parallel with the negative, that is to say the holder for the lamp should be fixed in the side of the box. For printing on gaslight papers, or for working from dense negatives, a very good lamp is a little 60 watt half-watt, giving a candle power of about 120. In this the filament is in the form of a ring, and the lamp holder should be on the floor of the printing box.

C. J.—So far as the photograph is concerned you are not running any risk in issuing the cards according to the customer's order. As regards the lines from a current Christmas card, these are probably the copyright of the Christmas card publisher, and the issue of them would be an infringement of that copyright, in respect of which both you and your customer would be equally liable. If, however, the quotation is from one of the poets copyright in whose works has expired (as is the case with most of the great poets) there is, of course, no infringement of copyright.

S. C.—Unless you are prepared to use plenty of light, and preferably electric metal-filament lamps, we certainly advise you to put on one side the idea of an enlarger without a condenser. If you are obliged to use gas, you had far better have a condenser enlarger, a very good model of which is the chain and sprocket of Butchers. The best gas burner we know for an enlarger is the "Howellite" sold by Griffins. There are no vertical enlargers on the market except the somewhat expensive ones sold for professional use.

COPYIST.—Probably the copyright has expired in the engravings and also in the original paintings from which they were made. If copyright in either form of the works is still in existence your reproductions would be an infringement. In order to satisfy yourself as to the existence of copyright it would be necessary to ascertain the dates on which the respective artists died. Even then it would be a rather complicated matter, since copyrights which were in existence at the time (June, 1912) at which the old Act was repealed, are prolonged by the present Act. We wish we could give you more definite information, but that is not possible from the brief particulars which you give.

W. A.—(1) A piece of dark red or green art serge, which you can obtain in 54-inch width, will make an excellent background. If you prefer you can use calico sheeting, distempered with black Kalko. You can get this in packets, price 1s. 6d., from the Vanguard Co., Maidenhead, or Messrs. Jonathan Fallowfield, 146, Charing Cross Road, London, W.C.2. (2) By rubbing gently on *very fine* glass paper. (3) Not as postcards, but as printed matter. The words "printed matter," and the address only may be written on the back. (4) We doubt if you will get any maker to supply odd sized mounts; buy the large sheets of card from a firm like Halsey and Davison, 14, Carlisle Street, London, W.1, and cut them up with a steel straight edge and sharp knife. If you dry-mount, the heavy-weight papers are quite stiff enough and easier to cut.

A. H.—(1) The only thing you can do is to stick up some kind of bust or other object, the image of which you can arrange and focus on the ground glass, afterwards yourself taking its place before the camera. We think if you arrange the head rest for the object when focussing, you will have no difficulty in putting yourself in the same position. (2) We do not think there is any mechanical shutter release, except, of course, the obvious one of a long length of rubber tube or metal cable release, which could readily be arranged so that it could be operated by the foot. Even the very simple device of a single flap raised by a thread and allowed to drop back after the exposure could be easily arranged by rigging up some kind of board, pressure on which with the foot would provide the requisite amount of pull on the thread. (3) There is no book on self-portraiture.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3219. Vol. LXIX. FRIDAY, JANUARY 13, 1922. Price Fourpence.

Contents.

SUMMARY.

In his "Paris Notes" M. L. P. Clerc mentions recent innovations in aerial photography, a new type of cinematograph projector, recent experience in Autochrome work, and the recent discovery of a pair of stereoscopic drawings made in the sixteenth century. (P. 15.)

In an address before the Annual Convention of the Photographers' Association of America, Mr. Pirie MacDonald discoursed freely of the principles which he had followed in his profession of photographer of men, and in particular on the course which he had found to be of advantage in establishing such relations of common interest between himself and his sitters as to lead to the making of a characteristic portrait. (P. 17.)

Opinions on the time fixed for the annual Congress of the Professional Photographers' Association are published from several correspondents. (P. 26.)

We point to eleven different forms of standing or overhead charge, a due proportion of each of which enters into the cost of every piece of work done in a photographic establishment (P. 13.)

The death is announced of Mr. David Bachrach, a pioneer of professional photography in America and an active experimenter in photographic processes. (P. 25.)

In a leading article we endeavour to show the value of observation in the carrying out of photographic processes. Every attempt to trace a defect back to its cause represents an addition of the most valuable kind of knowledge. (P. 14.)

At the Royal Photographic Society on Tuesday evening last the discussion on the desirability of manufacturers supplying figures indicating the contrast grading of development papers failed to elicit any considerable desire for such information on the part of users. Dr. Glover's paper, read in his absence through influenza, showed the practical difficulty of supplying really informative data. (P. 23.)

At the same meeting a most interesting demonstration was given of a new metal-filament projector lamp, suitable for enlarging and lantern work, which is just being introduced by the General Electric Company. (P. 23.)

In France the present year is being celebrated as that of the centenary of photography, the most recent inquiry having shown that the first permanent record by the agency of light was obtained by Niépce in 1822. (P. 13.)

According to a recent patent, self-toning emulsion is prepared with a compound of selenium or tellurium instead of gold. (P. 14.)

The leather or leather-cloth coverings on hand cameras, which have become shabby, may be renovated at little cost. (P. 14.)

The design of a direct-vision finder having special facilities in the use of a cinematograph camera is the subject of a recent patent specification. (P. 21.)

EX CATHEDRA.

Photography's Centenary. Our French friends, in the person of M. G. Potonniée, are just now taking an interest in determining, as accurately as may be done, the date which may be ascribed as that of the invention of photography. A paper by M. Potonniée in the Bulletin of the French Photographic Society, examines at length the stages in the early work of Nicéphore Niépce, who is rightly regarded as the first to produce a permanent record of objects by the agency of light. It appears from the early correspondence of Niépce which was published long after his death, and particularly in the now rare work by Fouque, "La Vérité sur l'invention de la Photographie," that in the year 1822 Niépce had succeeded in obtaining permanent copies by means of sensitive bitumen of Judea. As a result of his researches M. Potonniée rejects the earlier date of 1816, which apparently has been cited in reference to the earliest of Niépce's experiments with light-sensitive substances on paper. These, however, could not be rendered permanent. The year 1822 is confirmed by a number of Niépce letters of that date, and is in agreement with the tradition current in his family for a number of years after his death in 1831. Those who have visited the former Niépce's estate at Gras, near Chalon, will perhaps remember the monument standing near to the railway line, the inscription on which definitely names the year 1822 as that in which Niépce "invented photography."

* * *

Overhead. The eternal problem of how much to charge for photographic work which is different from the regular run of portrait offered by a studio is, perhaps, one which turns up more frequently than any other in questions which reach us on commercial topics. Putting aside considerations which are based on known competition which has to be met, a chief factor in determining the cost and therefore the price of such work is one to which, we fear, many photographers pay little attention, namely, the standing or overhead charges. Very often the cost of materials is a minor factor relatively to the proportion of these overhead charges which is, or should be, borne by a particular piece of work out of the ordinary. We have referred to competition, but too much importance should not be attached to it, for the two following reasons: that frequently a competing price which is quoted by a photographer who is asked to quote cannot be accepted; and further, if plenty of work is to be had, due importance for the proportion of standing charge will often show that at the competitive price the work is being done at a loss. It may be of service to those who do not have given as much consideration to these charges as should be the case, if we set down a list of eleven different sections of them, which are mentioned in a Canadian journal circulating among retail chemists. They are: 1. rent; 2. light, heat, power and telephone;

3, salaries of owner and assistants; 4, delivery cost; 5, interest on capital; 6, insurance, taxes and subscriptions; 7, bad debts and collection expenses; 8, advertising; 9, depreciation of equipment and stock, repairs and renewals; 10, expenses, such as breakage and spoilage, returned goods, reductions; 11, miscellaneous supplies for offices and workrooms. Costs belonging to all these sections apply equally to the whole turnover for the year, and on the presumption that the total of them and also the total turnover for the previous year are known, the amount which requires to be allotted to a particular job is readily computed. From the actuarial standpoint this is, perhaps, a crude method of describing what should be done; nevertheless, it is a good deal better than the common practice of neglecting "overhead" altogether.

* * *

A Tar Camera. Considering the resources of the English vocabulary, it seems a pity that the word "camera" should be applied to instruments which have nothing to do with photography or even with light. In the current issue of the "Gas Journal" we see described an appliance for the approximate measurement of the quantity of tar in town gas. It is an American device by which a deposit of tar is obtained on a sheet of white paper, and is called a "tar camera" by its inventors or users in the United States. It is, of course, in no sense a camera, but simply a chamber into which the stream of gas is led. We suppose our American friends would justify their appropriation of the word by saying that they are using it in its old literal meaning. But the literal meaning is, if anything, more specialised than that which is associated with photography, and survives only as the name of the legislative chamber in some Latin countries and in the judicial phrase *in camera*. There is really no excuse for misuse of a word which is so firmly rooted in the popular mind, and which, in the present instance, is readily replaceable by "indicator," "tester" or a similar term.

* * *

Goldless Self-Toning Papers. During the last few years a good deal of interest has been taken by German experimenters in the use of selenium and tellurium compounds for the toning of development prints, but a somewhat unexpected application of these substances appears to have been discovered. According to a patent specification of the Dresden firm of Kraft & Steudel, a print-out collodion emulsion containing selenium dioxide or telluric acid, the latter dissolved by means of lithia, yields brownish purple tones when fixed in an acid bath consisting of 5 per cent. hypo and 10 per cent. potassium bi-sulphite. The emulsion is one prepared by addition of silver nitrate, lithium chloride and citric acid to 4 per cent. collodion. The effect of the selenium or tellurium compound is stated to be similar to that of the gold chloride as a constituent of a self-toning emulsion. But, so far as we are aware, nothing is known of the degree of permanence of prints made on papers, in the coating of which the place of gold is taken by such compounds as these of the baser metals.

* * *

Worn Camera Coverings. Judging by the many hand cameras that we have seen the leather or leatherette coverings of which are decidedly the worse for wear, it might be assumed the renovation of such is a more or less difficult job. The reverse is actually the case, and perhaps some of our readers may like to take the hint, when their cameras are at rest during a quiet season, of improving their appearance for the coming fine days. If the covering has only become dull, a good brown polish may be applied with a piece of clean rag, rubbing it well in and giving a final polishing with a clean, dry, fluffless cloth. If the camera has been more or less neglected and its black covering has discoloured, it may be re-blacked with leather dye, obtainable at any saddler's. The dye should be applied with an odd piece of cloth, care being taken not to make the covering too wet, or the glue attaching it to the camera may become loosened. If the dye is not available a black, not blue-black, writing ink may be made to serve. When the black has become thoroughly dry the covering may be given a coat of a good, quick-drying spirit varnish, which will be found to restore much of the original appearance.

FAILURES THAT TEACH.

THE facilities for turning out good work, for which the present-day photographer has to thank the plate and paper makers, have tended to make him less thorough in his methods, and certainly less skilful than were the old wet plate workers. When everyone started from practically the same point, by buying unmixed chemicals and plain glass, any difference in quality could only be attributed to the skill of the worker and the circumstances in which he worked. If his negatives were foggy or his plates were slow, he had to trace the cause of the trouble, and usually gained some valuable information in doing so. There was no opportunity of changing his plate maker with the idea of mending things, so that self-reliance was fostered and success was the direct result of effort.

Many, if not most, of the difficulties which arise would be avoided if a regular course of technical instruction formed the prelude to entering upon a photographic career, but unfortunately only a few are in the happy position of having received such training, so that knowledge must be gained piecemeal as the exigencies of daily work demand it. The first step is the cultivation of the habit of accurate observation. Failing this progress will be slow, and discouragement must inevitably ensue. This may be illustrated by recounting an actual experience. A portrait operator had been troubled by the appearance of semi-transparent patches upon his negatives, especially during hot weather, and attributed them to faulty coating. He thereupon changed his plate maker, and for a time the negatives were perfect, but in the course of a few weeks the trouble reappeared, and he was forced to conclude that the fault lay in the manipulation and not in the manufacture of the plates, and set about discovering the cause. It was found that the plates were perfect when placed in the washing tank after fixing, but on removing them from the water in the morning certain of them bore the disfiguring marks. This pointed to the fact that the gelatine had become partly decomposed and had dissolved in the washing water. The next batch was washed for about an hour and put in the racks the same night, the result being entirely satisfactory. Without the careful observation which noted the stage at which the spots appeared a further change of plates might have been made, and if these had happened to be coated with a very hard emulsion, which withstood the prolonged soaking, two plate makers would have rested under the unfair imputation of issuing faulty materials. It was not long before the knowledge thus gained again became useful. The printing was nearly all done upon gelatino-chloride paper, and a sudden epidemic of fading set in among the prints, even those in the showcases only lasting a few weeks. The photographer at once suspected that the same decomposition which had spoiled his negatives was working havoc among his prints, and a careful examination showed a slight unevenness upon the

glossy surface. The time of washing was curtailed and the trouble did not recur. Here we have a fair example of the value of careful investigation, for it enabled the photographer to use such materials as best suited his purpose without fear of the fatal markings.

All defects are not so pronounced as were those in the foregoing instance. In some cases it is to be feared that they are hardly recognised, but it may safely be concluded that if one's prints do not equal in technical quality those exhibited by the best workers there is a reason for it and that this reason should be discovered. One of the commonest defects at the present time is the wretched colour of sepia-toned bromides. Apparently, many photographers consider it unavoidable, but a little investigation will soon prove the contrary. It may rest with the negative, which may be too flat to yield a tonable print; it may be imperfect washing before toning, the use of a weak sulphide solution, or over-exposure and under-development of the prints themselves. Here it is clearly open to anyone, who feels that his tones are not as good as they might be, to track the defect to its source.

In every branch of photography may this process of observation and rectification be carried out, and in none is it more necessary than in the lighting of the sitter and exposure of the plate. If the print does not give the impression of the sitter as he appeared in the studio, one or the other of these points needs attention. Some photographers have the belief that "Rembrandt" negatives must needs be foggy; no greater error can be made. Others, habitually, under-expose and over-develop their negatives, with the result that by the time the face is printed all detail in dark clothing is buried. To such the advice may be given to study the best work within their reach and to form the resolve to find out wherein their own falls short. The specimen prints issued by plate and paper makers are highly educative, and will do much to point the road to good work to those who wish to follow it. If the road be found too rough, then a friendly hand must be sought, and this will readily be extended by the trade demonstrators, while our own "Answers to Correspondents" column is always at their command.

It is to be feared that the average photographer is not a reading man. If he were to study, and profit by the information which is printed week by week, he would have fewer tribulations. It has been reported upon credible authority that some photographers do not even trouble to read the instructions issued with the materials they buy, much less to follow them.

The investigation of defects should be undertaken with all possible care. Chemicals should be weighed and measured, dishes and apparatus should be clean, the dark-room lamp should be beyond suspicion, and the camera, and particularly the lens, clean and free from dust. Every precaution taken in this way is a step on the road, as it eliminates a certain number of causes of error and leaves a clearer way to tracking down the defect which is to be sought for.

PARIS NOTES.

Aerial Photography and Photo-Surveying.

A REVIVAL of interest in aerial photography has resulted from the exhibition at the seventh Aeronautic Salon, held last November, of equipment for aerial photography and of examples of the extremely fine work done by the various French firms who have taken up this subject. Some new introductions were shown, notable among them two film roll-holders, one taking a hundred 18 × 24 cm. pictures made by M. P. Garnier to the specification of MM. Libman, Galiment and Lenouvel; the other, for 350 exposures of the same size constructed from designs by Captain Paumier by the Puteaux army arsenal. The latter, however, was exhibited only as a non-working model, from which it was impossible to form an opinion of its action. The Cadastral Service of the Liberated Districts showed a Rolland changing box for 150 exposures on 18 × 24 cm. plates, made by the Société Optia, and also a between-lens shutter for a 20-inch f/6 lens, made by the Société d'Optique et de Mécanique de Précision, which firm during the war supplied the bulk of the lenses employed in the Aviation Service. The Cadastral Service also showed in action the camera of H. Roussilhe for the correction of aerial negatives taken with an oblique lens axis. An apparatus for the printing of long bands of film negatives on to continuous bands of bromide paper was shown by the Société Filmographe in the shape of a Prestotype printer of M. L. Lobel, constructed on the same principle as the cinematograph printer of the same inventor and providing the necessary automatic variations in the strength of the printing light for each negative in the film band.

During the period of this exhibition there was opened at the headquarters of aeronautic equipment at Chalais-Meudon, near Paris, an aeronautical museum, which contains a photographic section, small at present, in which are brought together aerial cameras taken from the German army. The museum is open to the public on Thursday and Sunday afternoons.

Stereo-photogrammetry, which up to a few years ago was greatly neglected in France, is now being closely studied. The Société Française de Stereo-topographie, recently formed in Paris on the initiative of M. P. Corbin, who has introduced these methods in France, has made an arrangement with the firm of Zeiss for the application in France and the French colonies of stereoscopic methods of making maps, and in particular for the use of the von Orel stereo-autograph, the latter an apparatus devised by the Austrian Geographic Service for the automatic drawing of maps and of their contour curves.

A French railway engineer, M. J. Prédhumeau, with the aid of a subsidy from the Ministry of Public Works, has set out to obtain equivalent results with a much more simply constructed camera, and has made an experimental model of his "Stereo-topometer," which has given every satisfaction in the course of its first trials.

It may be finally added that another engineer, M. Poivilliers, belonging to the Compagnie Française de Navigation Aerienne, has patented a camera based on both the Bildmesstheodolite of Hugershoff and the von Orel Stereo-autograph for the application of stereo-photogrammetry to aerial photographic negatives.

Cinematography.

An event of great importance in cinematography is the recent introduction of the "Mundial" cinematograph projector of the firm of Continsouza. This apparatus must be said to be not merely an improvement on existing types, but an entirely new and excellent conception. The shutter, which is of truncated conical form, is placed between the condenser and the film. Flicker is absolutely eliminated by the direction and speed of its rotation, as is shown even when the apparatus is run without a film. Wings mounted on the shutter cause it to function as a powerful fan, strongly cooling the film and permitting of any single picture being projected in the ordinary way. The film passes into an absolutely closed

channel, which completely separates it from the mechanism and, moreover, provides an absolute preventive of the film catching fire. If the motor of the projector is stopped, if the fall of the safety cut-off is intentionally prevented and if the shutter is turned in the open position, the film will catch fire, but the combustion is limited to the piece of film contained in the gate and does not even extend to the perforations, so that after such an incident projection is continued when restarting the motor. The efficiency of these arrangements is such that the constructors have obtained from the authorities permission to dispense with the water cell, the use of which has hitherto been compulsory in every cinematograph exhibition.

At one of the recent meetings of the cinematograph section of the French Photographic Society, M. L. Clement, a leading authority on cellulose ethers, gave a very interesting talk on non-flam film of cellulose acetate. The difficulties which some manufacturers have had arise from the random choice of the cellulose acetate. This latter is available not as a single definite substance, but there are several cellulose acetates differing very greatly in their properties according to their source. Varieties which are the best for varnish making are not suitable for film manufacture, and *vice-versâ*. The technical experts should be able to specify the qualities which a cellulose acetate should have in order to fit it for the manufacture of cinema film, and it would be easy for manufacturers to conform to these descriptions. The characteristics of a good cellulose acetate film are very little different from those of a celluloid film, and the resistance of the former to abrasion is greater. Most of the celluloid negative film, moreover, has a coating of cellulose acetate in order to prevent electrical markings.

As a result of this conference a committee has been formed to define the chemical, physical and mechanical properties required in cellulose acetate for cine films, and the technical experts of the cinematograph film manufacturing and producing firms are represented on it. Another committee has also been established in order to endeavour to obtain an international standard for perforations and for the marginal notches indicating the required alterations in the light when printing from negative films.

Colour Photography.

An experiment which would have been very interesting if it had been carried out more strictly and systematically was recently made by the colour photography section of the French Photographic Society. A number of Autochrome plates coated with the same batch of emulsion were exposed under identical conditions (the three plates of each set of three receiving different degrees of exposure) on a still life subject consisting of bronzes, flowers, and fabrics, illuminated by electric light. Each set of three plates was developed by the advocate of a particular method of development. Unfortunately none of these workers were accustomed to the illumination of the dark room in which development was done and, therefore, the results were greatly inferior to those usually obtained by them. It seems, however, that some conclusions can be drawn from this comparative test. For Autochrome plates, the exposure of which has been somewhat cut down, the best results appear to be obtained by the Lumière metoquinone developer. For somewhat fuller exposure the pyro developer recommended on the introduction of the Autochrome plates serves well. It is recognised that this developer is the best for plates which have been kept considerably beyond the date allowed for their use by the makers. Lastly, the diamidophenol developer made acid by an appreciable addition of bisulphite so as to prolong the time of development to about an hour appears to give the best results from Autochromes which have been considerably over-exposed.

M Schitz, one of the most skilful workers of the process, has recently shown some very fine landscapes made in quarter-plate size with a 15-inch lens. The narrow angle of view requires that the foreground should be at least about 150 ft. from the camera, with the result that the atmospheric effect is to soften the colours and to avoid too violent effects. At this small angle also it is usually an easy matter to obtain excellent composition without the inclusion of the sky in the picture, thus eliminating a feature of the landscape which is almost always unsatisfactory in an Autochrome unless it presents striking features.

A New Process of Colour Photography.

M. Leon Didier, inventor of the Pinatype process, has recently been granted a French Patent (No. 524,143 of March 17, 1919) for a new process of colour photography by printing from a negative in complementary colours (*e.g.*, an unreversed Autochrome) on to a sensitive film, or several such films, so that there is formed at each point a colour complementary to that in the negative, and therefore corresponding with that in the subject.

The inventor sets forth as follows the conditions to be fulfilled:—The three series of reactions, each corresponding with the production of a primary colour, should be chemically and optically independent; fixation should be possible for the three sensitive films by a single reagent, or, at any rate, by reagents which can be mixed together.

The leuco compounds of certain dyes alone or in a mixture with other substances are sensitive, particularly to rays complementary to the colour which the compounds assume on exposure to light. For the production of the yellow image other reactions may be employed, taking place only under the influence of the actinic blue and violet rays. Fixing is to be done in a solution of monochloracetic acid, with addition of stanneus chloride.

Stereoscopic Work.

M. G. Potonniée, one of our most enthusiastic searchers of documents relating to the history of photography, has recently drawn attention to two drawings made by J. Chimenti (1554-1640) which are in the Wicar Museum at Lille. These two drawings form a beautifully drawn stereoscopic pair made two centuries before the invention of the stereoscope by Wheatstone.

M. Guérin, maker of the well-known Leroy stereocycle, in collaboration with M. Delens, has recently designed a very compact new model of magazine stereoscope, in which the transparencies are handled with great speed and certainty. Its all-metal construction leaves nothing to be desired as regards mechanical perfection.

Pictorial Photography.

The great success of the competition organised by the "Revue Française de Photographie," particularly in regard to the standard of the work submitted to the judges, denotes a reawakening of pictorial photography in France. Moreover, a Salon of Photography will probably be held in Paris in 1922 under the management of a group of the principal photographic societies in conjunction with the "Revue Française," thus restoring a feature of French photographic activity which has been dormant for nearly ten years. The difficulty in obtaining a suitable place for such an exhibition is likely to limit the number of works which can be shown, but upon however modest a scale the effort is made it is bound to have a highly favourable influence upon the progress of pictorial photography in France, where the high price of photographic requisites has had a strongly deterrent effect upon this branch of the art.

The Constitution of Developers.

A few months ago M. M. Abribat, in a paper before the French Chemical Society, pointed out that he had been able to develop photographic plates by means of products obtained by the action of sulphurous acid on a solution of fuchsine or malachite green. To these solutions, in which M. Abribat admitted the presence of the corresponding leuco bases, carbonate of soda was added at the time of use. Although without any practical interest, this observation had a certain importance, since it represented an exception to the law laid down by MM. Lumière on the chemical constitution of organic

developers. MM. Lumière and Seyewetz, in repeating the experiments, have shown, on one hand, that the method of preparation does not yield the leuco bases, but carbinolic bases, and, on the other hand, that in a pure state neither these compounds nor the leuco bases possess developing properties.

MM. Lumière and Seyewetz have shown at the same time that the images developed with indoxyl or thioindoxyl, according to Homolka, are due to a very different reaction from those which take place in the use of the customary developers, and that such images, whilst very weak, do not contain (in addition to the colouring matter) metallic silver, but most probably silver sub-bromide.

Notes and News.

The Institute of Theoretical and Applied Optics, established in Paris, at 140, Boulevard du Montparnasse for the training of constructors and workpeople in the scientific instrument trade, have just commenced the publication of a monthly journal, "La Revue d'Optique." The director of this Institute is M. Charles Fabry, Professor of Physics in the Sorbonne, to whom the Franklin Institute of Philadelphia recently awarded one of the Franklin Medals for his optical researches, in particular in spectroscopy.

The annual meeting of the French Society of Industrial Chemistry, held in Paris during the second week in October, announced a section devoted to photography. The announcement of the congress, however, was made so late that, for lack of anyone to take part in it, a meeting of this section could not be held. Sir W. Jackson Pope addressed the general congress on the future of the organic chemical industry, and was awarded the gold medal of the Society of Industrial Chemistry.

Several Parisian newspapers recently reprinted an article from the "Times" according to which synchronism of movement and speech in cinematograph projection "had just been discovered." M. Léon Gaumont, who in 1901 solved this problem, with the help of his colleagues, has since perfected it, and has on many occasions given public demonstrations of his Chronophone or Talking Film (notably in 1902 and in 1911 at the French Photographic Society), has naturally been prompted by this announcement to draw attention to his invention. At a meeting of the French Photographic Society on October 28 he again gave a performance of several talking films. The present apparatus is certainly capable of further improvement as regards the quality of the sound and the means of register, but nevertheless it achieves absolutely the automatic synchronisation of a cinematograph and a phonograph.

L. P. Clerc.

THE TRICK OF PHOTOGRAPHING A MAN.

[The "Minutes of Proceedings" of the thirty-ninth annual Convention of the Photographers' Association of America, held at Buffalo last summer, have been published as a handsome volume of over 200 pages, edited by the general secretary of the Association, Mr. J. C. Abel. In addition to containing twenty-one supplemental reproductions of American professional portraiture, it brings together an almost verbatim report of the proceedings at the many meetings which were held. Owing to the fact that demonstration went hand-in-hand with talk in the case of most of the fixtures, it is not possible usefully to reprint addresses which very plainly had a great value for those who heard them. But a discourse of Mr. Pirie MacDonald's, while dealing in an eminently practical way with the conditions of studio portraiture, is of such a form that a place can be advantageously given to it in our pages. Mr. MacDonald had much to say on lighting, but his chief theme was the establishment of such relations of common interest between the photographer and his sitter which make for successful character rendering in the resulting portraits. His talk on this congenial topic was flavoured with much characteristic humour.]

There is unrest on the part of everybody at the moment, in the matter of equipment. Everybody seems to be hunting around and wondering whether it isn't a solution for all the troubles to have new and different equipment, like the man who went to see the doctor. He had been to this doctor many times, and the doctor said to him, when he came in, "What's the matter with you now?" and he replied, "Well, ye see Doc., I don't know, but what's new?" (Laughter.) And so it is in the matter of equipment. It doesn't seem to make much difference to people what it is, so long as it's new. They want a change. It's a very healthy symptom.

But it is true, as people who have been doing home portraiture have proved, that it doesn't make an awful lot of difference what the apparatus is, what the light is, for example, so long as you have plenty of it: it is absolutely necessary that you have plenty of it, but plenty of it for the particular purpose. If one is going to make a large group, of course, you have got to have an illuminant that will cover a large group. If one is going to make a single figure you have got to have the right light for a single figure, or the head.

In the old days we put up a light that would make a picture of forty people at once, and then we became accustomed to using a light adapted to the making of forty heads for the making of one head, and wondered what was the matter with the one head, and so it is particularly with the electric light. You have got to have a light that is adapted to the purpose for which it is intended, and I claim that a person is very ill advised who puts in a light which will do four times—eight times—twenty times as much as they need, and work with the handicap of an uncontrollable light. A principle in electric lighting is that almost any light will answer if you are going to make a single figure, provided the light is adapted to the room in which you are working, making pictures only of heads—there isn't any reason why your room should be more than 6 ft. wide and perhaps 6 or 7 ft. high, so that you may utilise the natural reflex of that light, in order that the direction of the light as it comes immediately from the source, may be felt as direction in a perfectly and properly rounded picture, whereas, if you were to take that same illuminant, whatever it be, and put it in this hall, with all the lights turned out, as you know, it would be a very inadequate affair.

An illustration in the particular case, is this: If one were to take a little candy box, that is perfectly white on the inside, and would put a little doll inside it, and light a match and put it through a hole into the box, you could make a photograph of that mannikin like a flash. You might take that match at midnight here in this hall and put it as close to the human face as you wanted to and you couldn't by any possibility get an exposure, except perhaps at the point of the match. The keeping of all of the light of the match in the box is the trick. Almost all of the light, in the case of this hall at midnight, would be dissipated in the surrounding dark.

And so it is in the case of making pictures of children. Mr. Core and I have talked the matter over many times, and we have finally come to the conclusion that in order to make pictures of children rapidly, in a fixed studio, an ideal arrangement would be something like this: We will imagine a piano box, such as an upright piano comes in,

and we put it up on a little platform with a set of steps leading up to it, and we would put one light—anything you like—so that all the light is contained in that box. Make your side walls and back in a light key and put a little shade forward, so that even what light might go out at the top would be sent back, and you can make pictures so rapidly and so thoroughly timed and balanced that the hard work of making children's pictures would be a joke. The bread-and-butter pictures that will serve every time, dead sure—can be made right off, and then if you have a lot of money and a lot of time, you can take the child into a dark room as big as this, and you can make all of the high art you like to amuse yourself. But bear in mind that those things that are fully illuminated and made so rapidly that you have the heart of the youngster in his face, they are the bread-and-butter pictures; they are the things the people want.

In handling light you must always hark back to fundamentals. There are to-day in this profession, not here in New York alone, but all over the world, a set of people who put things across because there is a certain proportion of the public that is looking for novelty and will buy anything. The girls on the street to-day, beautifully gowned, showing perhaps a little ankle, would give up all of that snappy look when someone brings out a gown that covers even the ankle, if it is supposed to be new. And it is the same way with photographs There is a clientèle for every freak. They say that in New York you can sell anything, but it is so in the smallest town in Ohio. You can sell anything. You cannot sell it, perhaps, in volume enough, but you can sell anything.

But we are not of the kind of people who make pictures as some painters do, after they have muddled along and finally finished the thing, they have a devil of a job finding a name for it. That isn't the kind of stuff we are supposed to make. We are professionals. We are supposed to know what we are going to make and proceed to make it.

In the matter of light, fundamentals are necessary. There is a formula of light—some of you youngsters are very apt to say, "Formula of light; there shall be no formula of light, we ought to make pictures anywhere, anyway." But there is a formula of light that has been passed down through all the good portraits. There is one way that you do get projection; there is one angle, one type of volume that all of the painters have used, and are using to-day, and the fundamental is to get your face into projection that will revive the memory of the person who sees it, and if they remember the person that was photographed and not the photographer who is trying to put on airs, that is the test.

Therefore it is necessary, in the handling of light, wherever the light may be, wherever its source, to have such a light that you can project that face in the formula that the painters have used these three or four hundred years. It must, in order to get that projection, be from a single source (and there are some people in the audience who will say "Ha, ha! he is stepping into a trap"), but I have thought that out carefully, and that it be done in the most absolutely simple manner possible. The light must be merely the exposing element, that which makes it possible for the eye of one person to see on an otherwise blank piece of paper that which stimulates his memory. It must bring about the utmost projection as governed by the necessity in the case—the necessity in the case being the type of person that you are representing, stronger in some cases, less strong in others. If it is not done so that projection is an absolute, dead-sure thing, you are not going to make the pictures that will do the work that you intend them to do, which is satisfying the people that you are selling goods to.

Some of you will say, "Why is it that you have played so much with the double source of light?" You will find that there never was a picture that was made in my studio even with a double source of light, but that had originally, and, taking out the secondary light, projection, absolutely and completely done first, and then the secondary source added for reasons that seemed to justify its use.

The reason I am explaining this at this length is that there has been an unfortunate tendency on the part of photographers, myself among them, to see something that has attracted in the work of another man, and literally copy it. Educationally, it is a good thing to see whether you can do it, but you have got to know the reason underneath it before it is going to be of definite and lasting value. Every now and then we find a person of such indeterminate arrangement of features that if you were to set them down with a light which merely projected their features it might not be highly interesting, but if you take your regular formula of light and soften it down with the projection still there, but so soft as to be even less distinctive, and then you find that the man has one corking good line, say, down his nose, which is in keeping with a point in his character, it will shape the things up and make folks say, entirely aside from the work of the man who has done it, "an interesting personality." I claim that is a legitimate purpose for a double light.

I had, a little while ago, a man who was unfortunate all through the lower part of the face—a mighty strong person, and there are many strong people who are too strong of the animal to be pleasant. They have done things because what mind they did have was backed by a body that permitted them to go through and do things even though it caused them physical pain, over-work, over-hours, over-everything that most people shirk, but they had the body that was able to push through their mind and that shows in the lower part of the face. He had heavy lips, an over-sized chin, a bad nose—too bread at the base—animal—but the man was an interesting man. He had done things, and was entitled to be known by the world as a person of distinction. If I had lighted him in the old formula, in the even sort of way, I wouldn't have given that man his proper place in the world. But! In connection with all of this he had a magnificent forehead. He had hair that grew down in a vigorous sort of way, well over the forehead, with an opening here and there, and I put the finger of light to his forehead in order to show that he had mental capacity. But bear in mind that you mustn't ever use a double light until you have demonstrated one thing first—the portrayal of the man in just and true projection.

There was a man named James Inglis (a lot of you don't remember him, some of the older fellows do), and we had a tumultuous Scot, named Dundas Todd, and in his turbulent way he had to find something to devote his energy to, and he was very glad to find that there was a man named Inglis who had been doing a thing or two in the way he thought was the proper way to do it, and he made quite a god of Inglis. The only reason that Inglis was entitled to a saintship was that, with persistence of the Scot, he had acquired the idea of this simple old projecting light, and he had never let go of it for one minute, and, with the persistence of the Scot, he rammed it down our throats until a lot of us, then younger men, side-stepped him; but Dundas said, "No, ye'll not get away so easily as that, and I'm here, I'll make ye take it!" And he did; he wrote a book on it, and the result is that Inglis to-day is the father of most of the legitimate portraiture of America.

He was a Scot of an unusual kind. My father was a Scot, but alongside of Inglis, even with his bit of doggedness and tenacity, he was a plaything, he was a Dresden china doll. Inglis was the kind that they made the John Knoxes out of; he was the kind that made that old type of Presbyterians who said, "It doesn't make a particle of difference who you are, you're goin' to Hell. That's the kind of material he was made of, and one day, thirty years ago or so, or perhaps a little longer, he came into my studio in Albany and he was showing a little formula of paper, a really choice bit of glossy emulsion paper, and we were making albumens at that time, but we didn't want to make paper, but told him if he would make it we would buy some. He said, "I'll sell the formula, but I'll not make the paper, and you'll have your own troubles with it." And he sold the formula. I, with the confidence of youth, brought out three

of my pictures. I remember one of them distinctly. They were things that I was sure were good. At any rate, they were such an advance on what I had been making that I was distinctly proud of them, and carefully slipped them into his hand. He looked at them with those bushy brows of his, one at a time, and he said, "Who made them?" With due and proper modesty I said, "Why, I did," and he said, "Never tell anyone that ye made them. They are bad—they are bad, man." And as I see it now, they were—the dear man was right. They were made following a trick, the trick of a man that I had observed and admired. They were made without basic knowledge. They were not made with projection, they were made to show how smart I was, not the value of the person I portrayed, and he thereupon gave me a lecture on the validity of lighting which will produce projection in a proper and orderly fashion so that the nose stands ahead of the forehead; so that the forehead stands ahead of the cheek, so that the cheek stands ahead of the ear. There is only one formula for that. James Inglis was right.

I have said these last few words only in order to show you that it is my firm and persistent belief that tricks that cover up your otherwise bad workmanship won't get you through. You mustn't rely on tricks, you have got to make the legitimate. Your customers want it. Bear in mind that the minute that they commence deeply objecting to things, you may know there is something wrong about the pictures. It doesn't pay to make any difference whether you know that they could pass the jury of the P.A. of A., the purpose is to please the customer, and there is something wrong about them if you have not pleased the people you are taking the money from.

Every now and again somebody says, "But about these lenses. The old-fashioned sharp lenses don't please me any more. These softer types of lenses please me much more."

Ah, yes—good! You have moved on! You have come to realise the fact that the human eye does not see the human face as the old type of lens, the German type of lens—the English type of lens showed it. The human eye doesn't see faces that way, unless you are unfortunate and have a bad set of eyes and have gone to an optician who, in order to sell you a more expensive pair of glasses, has given you something abnormally strong—stronger than you ought to have, otherwise you cannot see a human face made up of a multiplicity of detail, such as the old type of lenses set down. The minutia of the human face is not observed by the eye in the way that the old lenses did it. But!—the public became accustomed to it, and you are still selling to the public, and you have got to be careful.

Suppose, for example, you were to go to a restaurant, and you were to find yourself served with a dish surrounded by ice—a little bit of a dish that cost you a dollar and a quarter—and you spread it on the bread, and you had a little bottle of what used to be, but ain't no more, and you found that there was a something in caviare that was remarkably nice, and then you wanted to feed your family, so you went out and bought a hundred dollars' worth of it and fed them only caviare! It is exactly the same way with feeding the public a too soft type of picture. The dear tummies won't stand it!

There is quality in the soft focus lens that is the right quality: it presents the projection of a human face in the fluid manner that the human eye sees a face, and not in the minutia as the old lens saw it, but be a little bit careful of your customers. Bear in mind that Inglis could sell me that formula or not: if he did not, he could take it to someone else, but you are in one town, and you have got to keep solid with those people *all* the time. Lead them along a little bit, break them into the idea that this is infinitely better than what the old type of lens presented, but be *careful* of thrusting things down people's throats.

There is little in the way of material equipment but that you have probably got at home or could go out and buy in the hall. I was thinking, though, last night, and I am going to put it in your minds, because the minds of so many people as we have here, working on one thing, may develop something. Do you realise that there is no artificial proof-printing apparatus in America that is worth a snap. You cannot print fast enough and soft enough at the same time with any piece of apparatus we have got. There aren't any of them adequate to the purpose. The ideal thing would be this: Something that would hold ten, fifteen or twenty, eight by tens, so that you could buy four or five of them, and if you only had ten proofs to make, use one; or if you had twenty, turn on another, or a third, and so on.

Now in the matter of the making of portraits of people, the great thing is to know what you want. The light that you have is in all probability more or less adequate to the demand that you have, but you have got to find out what you want to do.

There was a chap over here named Carpentier who proved that it doesn't make much difference how fine your punch is if you don't know how to use it. So it is with apparatus. You can buy all the things that are here, and if you don't know how to use them they are not worth much to you.

A man came to me three or four years ago, and he said: "Do you have trouble with your assistants getting tired along in the afternoon?"

I said, "Are you talking about something new?"

He said, "Yes."

"No," said I, "I haven't any new problem of that kind." I told him that it had been with me for years, and he said, "I have here a salve, and if you give a box of it to each of your men who have to stand on their feet all day and tell them to rub their legs with it, it would relieve them, and they would immediately get energetic, and the afternoons would be as productive as the mornings."

I said, "Say, son, have you got anything I can rub on their heads?" (Laughter.)

That reminds me of a story—the last was not a story.

There was a little store in the village, and the drummers all used to drop in, and there was an old darky who sat by the stove all the time. One day a man, pretty apruced up, came in and sat down. He lit a cigarette, and seemed to be quite energetic, and the old coon said to him:

"Say, boss, is you-all a commercial traveller?"

"Why, yes, I'm a commercial traveller," was the reply.

"Well, what you-all sellin'," asked the darky.

"I? I'm selling brains," the fellow told him.

"Say," he said, "Boss, you'se de fust travellin' salesman ever come through this place ain't carried no samples." (Laughter.)

You have got to be careful about that. There are too many photographers who are spending too much time learning little tricks that they are able to do mechanically, without thinking. They do them over and over so many times that—Mrs. Jones comes in, and they sit her down here, that is No. 1. Then they tell her to stand over there, that is No. 2. And because they have to have a No. 3, they sit her down here, and bingo!—out goes Mrs. Jones; and, if she is lucky, she draws what she wants. The photographer forgets that it isn't a picture of this outside of a person's face that is wanted. It is something else.

Now what is it we want? What we want is intimacy. There was a dear old man twenty years ago who used to bore me to death, and if he were alive now I'd apologise to him most deeply. His name was Dabbs, and he was from Pittsburgh. He threw a particular hook into me, but I guess he rather thought I was the kind of a person that needed it, and he used to sidle up to me every time I went to a convention and tell me that there was one thing he tried more than anything else to get—said he didn't give a damn about anything else—if he could only get expression. But he told me that some thirty or forty various times under some thirty or forty various circumstances, and I got pretty tired of it. I would take him out and get him a drink, two or three quick ones, so he wouldn't tell it to me again, but the faster he drank the more he told it to me. He said, "You have got to be careful about that. You are making beautiful pictures.

but I don't give a damn how beautiful they are if they don't have expression."

After awhile—after poor old Dabbsy had gone on (the people we owe most to somehow or other get away before we are able to tell them how much we owe them), I seemed to say automatically: "Expression is the thing." And then, after another while, I became conscious, and I said to myself, "Expression! Certainly; but what kind of expression?"

What is the thing that we have got to get into those portraits in order to have them of real value?

I finally determined that the idea was *intimacy*. Suppose you said, "Now while I am making this exposure I wish you would be so good as to observe the edge of that piece of wood!" (Laughter.) Now the picture is on the wall, and the person that loves the subject goes to the picture for sympathy, and only to find that the subject is looking at the edge of a piece of wood!

No, friends! There is something else. Intimacy! Intimacy—the kind of expression that a person gives a person they have respect for, and love for, and if you go through with your game, one, two, three, "good-day Mrs. Jones," they are not going to have "intimacy." You might as well have a towel on your arm and serve frappe bouillion.

You have got to get intimacy (and like Dabbsy I say it again)—you have got to get intimacy on the part of our sitter if you are going to have pictures worth making, worth your taking the money for.

Every now and again somebody comes in and says, "Mr. MacDonald, I just don't like them." I look at them from the point of view of the workmanship and they seem pretty good to me, and I say, "What is the matter with them?" and if by any chance they say "The man in them looks as though he didn't like me," or words to that effect, get rid of them! I get them out of my way and say, "Now you send him to me and we will get him so that he really does like you," and we will start all over again from the beginning.

"Yes, but Mr. MacDonald, I don't know that I can spend all that money again," and my answer is, "It isn't any of your business. That is my business. Send him to me."

Intimacy, friends, is the only thing that is of any value at all in a portrait

Intimacy—how are you going to get it? I happen to be fortunate. I happened to be born with a father who was the worst business man in the world. He was an absolute failure, from the point of view of money-making, but a charming soul, otherwise, so that, when I was eleven years old I had to go to work in an iron foundry. I have never been to school since. I don't know a lot of things a lot of people know, but I woke up to the fact that it was necessary that I know some of the things other people knew in order that they might meet me on terms of intimacy, and I went after it a bit at a time. There isn't anybody here that is as handicapped as I was at the time of which I speak.

How many people here know what is in the mind of the British people in regard to the Irish question? How many are able to turn and see the minds of the Irish people? Here we are in America, neutral, except that we naturally have a sympathy. We ought to have information, and nine out of ten of you don't know anything about it.

There is a book that was published a little while ago that created a furore all over the literary world, written by H. G. Wells, called "An Outline of History." I know H. G. Wells. I spent two weeks with him last summer. I never quite sensed him. There was something about him I hadn't got hold of. But for his "Outline of History" I take off my hat, and I have found that, having read it, a lot of people have a point of contact with me. It is a book that has caused a great deal of controversy, and has enlarged my opportunity for intimacy.

Every once in a while a physician comes in, and they are all interested in the anti-toxin idea. I had to find something out about anti-toxins because the darn things came up so often, and I know something about anti-toxin.

The other night I met a man working in a brass company in Bridgport, and found that there is a trolley wire which will five times outwear any solid copper trolley wire in the world. I know something about it now, and there is going to be a man come in some day who will talk about wire, and I am going to say, "Did you ever hear about that phono-electric?"

A while ago there was a man from Alabama and he was the entire smear—The Number-One-Topside-High-Joss of the town, and his wife confided in me. "Now we have got to have a picture of him. He has endowed the hospital and we need a good one. We have had some taken, but somehow or other they don't look like him." He came in and was pretty nearly as hard-boiled as they make them. He was one of that kind that you could put in a nut cracker and would fracture the cracker. I talked to him about the shows, and he had seen three or four and hadn't an idea. I talked to him about novels—he never read them. I talked to him about the Volstead question, and he didn't give a damn, never drank anyhow. Finally, he dropped a word, and I said to myself, "Ha, ha, in all probability he hasn't had much more fundamental education than I have. We will stop this high-brow stuff, and I said something about foundries, and he asked, "What do you know about a foundry," and I said, "Why, I was brought up in a snap-shop. The first job I ever had was shaking the stuff out of the flasks, putting them in a nail keg, and then hoisting it up on my shoulder and carrying it down and dumping them in a mill."

"My God," he said, "why, that's the first job I ever had."

It would be indelicate to mention in what amount we separated the man from his money, and not being of a boastful nature I shan't. But he needed a lot more things than they had originally planned they wanted. I discovered a great many uses for photographs that even his dear wife had never realised!

There is one thing, however, you have got to be rather a bit careful in this matter of intimacy. Two little girls came to a gate and there was a dog inside. They had to get across to the house for tea or something, and finally, after discussion, one of them decided that the thing to do was to walk right in as though they weren't afraid of the dog, and then he wouldn't bother them. But the other one, being of a kind and considerate nature, said, "But wouldn't that be deceiving the dog?" (Laughter.) And you have got to be awfully careful about deceiving the dog, because if the dog gets the idea that you are deceiving him it is all off with intimacy. The best you get is an imitation, and that doesn't sell very well.

Seriously; you have got to get down to the idea that an artist in our line has got to be a well-informed and well-balanced person. If you are down near Wall Street, you have got to know the market. You can't be a plagued fool and talk to the man about the kind of dresses the man's wife ought or ought not to wear. You have got to talk to him about something he knows about. If you don't you aren't going to get him to come up.

You have got to get to work to-day, and read your newspapers intelligently—and not look them over to find out whether Mrs. Stillman and Fred—or any of that kind of stuff—you have got to find out what the world is thinking about to-day; what the world is feeling to-day. You have got to know something about what is going on in your town. It is a mill town—what is going on in those mills? You can find out. If you are living in Detroit, find out what Henry Ford is doing—a constant topic of conversation—always have something to talk about if you follow Henry Ford. And if you don't educate yourself in that way you are not going to be doing your duty to yourself or to your clients.

Many people look on a photographer as a beach-combing tintyper or as an intelligent crafty artsman. You know the stripe that makes these soft and nebulous pictures that nobody understands, and nobody would care about if they could; you have got to be recognised as a solid man of worth, because you have brains in your head and you use them (Applause.)

In conclusion, I want to say: In the matter of intimacy

you have not only got to have things in your head—if you don't have a heart, you don't stand a chance. You have got to regard the man who is opposite you as a somebody, not merely a cheque-book, but somebody like you, if you are going to make pictures of that man's face that are worth while. You have got to have sympathy in order to have intimacy.

Now I make pictures of men I like, and you can't like a man without his liking you in some degree. You have got to have genuine sympathy for people. You have got to make up your mind that every man, woman or child that comes in has something in him or her that you will like and then hunt for it. The things you don't like, forget about—put to one side—see only the good things—really like them. If you find that you are only doing it in a "sort of way," merely finding those things that appear to be unpleasant cut your job and go away and clean your heart out, and come back fresh and new and be prepared to like people. Once you get so that you really like people—you won't bother about anything at all except the work that you have got to-day, and you will thank God in your heart as I am thanking God, that I am here, and that you have let me talk to you as long as you have.

PIRIE MACDONALD.

FORTHCOMING EXHIBITIONS.

January 11 to 27.—Camera Portraits, entitled "Men of Mark," by Walter Stoneman, at the house of the Royal Photographic Society, 35, Russell Square, London, W.C.1.

January 21 to February 4.—Partick Camera Club. Particulars from the Hon. Secretary, James Whyte, 51a, Peel Street, Partick, Glasgow.

February 7 to 11.—Sheffield Photographic Society. Latest date for entries, January 21. Particulars from the Hon. Secretary, James R. Wigfull, 14, Parade Chambers, Sheffield.

February 11 to 25.—Scottish Photographic Salon. Latest dates, entry forms, January 23; exhibits, January 31. Particulars from the Secretary, James F. Smellie, Braefindon, Allanshaw Street, Hamilton.

February 14 to 17.—Exeter Camera Club. Latest date for entries, January 30. Particulars from C. Beauchamp Hall, Hon. Exhibition Secretary, Exeter Camera Club, "St. Denys," Bellevue Road, Exmouth.

February 18 to March 4.—Edinburgh Photographic Society. Latest dates, entry forms, February 4; exhibits, February 9. Particulars from the Hon. Secretary, G. Massie, 10, Hart Street, Edinburgh.

March 1 to 6.—Birmingham Photographic Society. Latest dates: Entry forms, February 8; exhibits, February 22. Particulars from the Hon. Secretary, P. Dorker, Medical Institute Buildings, Edmund Street, Birmingham.

March 4 to 25.—South London Photographic Society. Particulars from the Hon. Secretary, Harry Abbott, 61, Beanval Road, East Dulwich, London, S.E.22.

March 8 to 9.—Birkenhead Photographic Association. Latest date for entries, February 25. Particulars from the Exhibition Secretaries, Messrs. Longstaff and Trace, 33, Hamilton Square, Birkenhead.

March 28 to April 1.—Hackney Photographic Society. Hon. Secretary, Walter Selfe, 24, Pembury Road, Clapton, London, E.5.

April 5 to 8.—Leicester and Leicestershire Photographic Society. Particulars from the Hon. Secretary, W. Bailey, Cank Street, Leicester.

May 1 to 6.—Photographic Fair. Horticultural Hall, Westminster Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1.

September 18 to October 28.—Royal Photographic Society. Latest date for entries by carrier, August 25. Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications December 28 to 31:—

SHUTTER MECHANISM.—No. 35,085. Shutter control mechanism for folding cameras. W. F. C. Devlin.

PROJECTION APPARATUS.—Nos. 34,341 and 34,842. Light-projection apparatus for optical projection lanterns, etc. P. E. Correll.

PROJECTION SCREENS.—No. 34,879. Optical projection screens. R. van B. Schele.

CINEMATOGRAPHY.—No. 35,032. Cinematograph projection. Stereo Kinema Syndicate, Ltd.

CINEMATOGRAPHY.—No. 35,136. Projection of cinematograph films. W. H. B. Streatfeild.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1s. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

CINEMATOGRAPH CAMERA FINDERS.—No. 145,656 (July 23, 1918). The camera, which is capable of being steadily moved vertically when being operated, is fitted with a finder eye-piece, and a

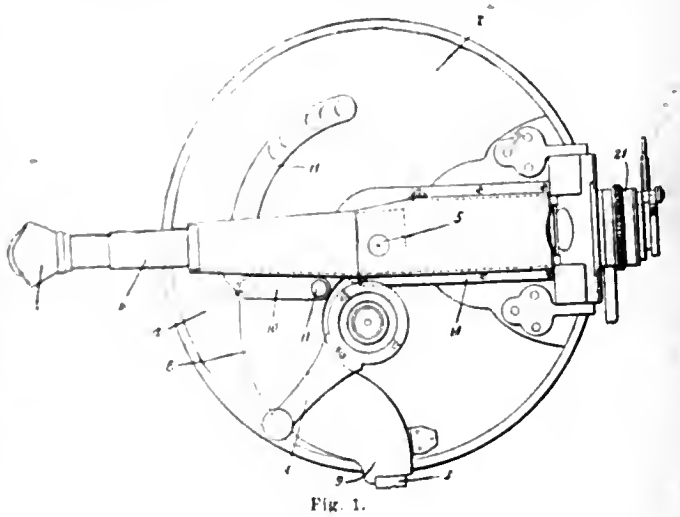


Fig. 1.

finder lens of the same character as the main objective, and the tube for the rays between the two is so constructed that the lens-carrying portion is movable with respect to the stationary eye-piece, the latter part being provided with a fixed and an adjustable prism whereby the light-rays through the finder lens will at all times be directed to the eye, in all positions of the camera and to whatever point the objective lens may be directed.

By this means any object moving through space may be readily kept in proper position in the field of the finder, and in a corresponding position in the photographic field, with the least possible difficulty, as the eye-piece is subjected to but slight movement and that horizontally only, and the object, whether overhead or below the operator, may be kept in view without any material change in the latter's position.

Fig. 1 illustrates the camera and the manner of attaching the finder. 2 is the cylindrical camera casing which is movable in both a vertical and a horizontal plane with reference to the fixed support which may be regarded as indicated by the post 3. The handle for feeding the film and operating the camera is marked 4.

At the point 5 is pivoted concentrically with the axis of the camera a sight tube 6 having a suitable eye-piece 7. This tube is rigid with a plate 8 which has its free end 9 in contact with the part 3 at any part of the camera stand or base so that it cannot he further turned in that direction.

10 is a resilient plate secured to the part 8 at 11 and having a stud 12 passing through a corresponding hole in plate 8 and engaging with semi-circular depressions in an arc-shaped bar 13, secured to the side of the camera and constituting a ratchet and forming a semi-positive lock therewith.

The lens-carrying portion of the finder attachment 14 (see figs. 2 and 3) is secured to the side of the camera and extends

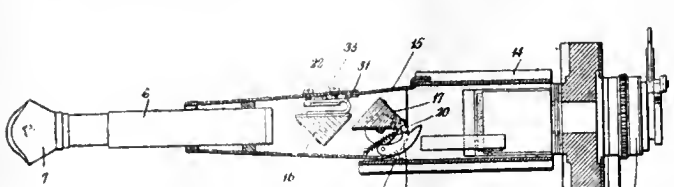


Fig. 2.

under the other part and is connected to its upper side by a strip of leather 15, so that when the camera is turned in a vertical plane the angle between the two parts of the finder may be varied at will. This is clearly shown in the drawings.

In the rear part of the sight tube 6 is a fixed prism 16, and supported concentrically with the pivotal point 5 is a revoluble prism 17. To one side of the tube 6 is pivoted a cam lever 18, having a rounded surface that bears upon a stud or pin 19 set in the lens-carrying tube 14, and the upper edge of this lever is fashioned to engage with a pin 20 on the support for prism 17, so that as the part 14 moves relatively to the part 6 the prism 17 is turned about its axis to receive the light-rays from the finder lens 21, and direct them at changing angles through the prism 16 and directly to the eye-piece 7 or axially through the section 6 of the finder tube. The stationary prism is preferably carried by an arm 31 attached to an opaque backing 31^1 which in turn is mounted on the side wall of section 6 by four screws 32 passing through the latter and holding a rounded point 33 against the normally stationary part of the tube 6. This accords a ready and convenient means of adjusting the prism to exactly its proper position.

In use, the normal position of the camera and its attachment is shown in fig. 1. The two parts of the sight tube are in alignment, and the plate 8 in engagement with the part 3. These

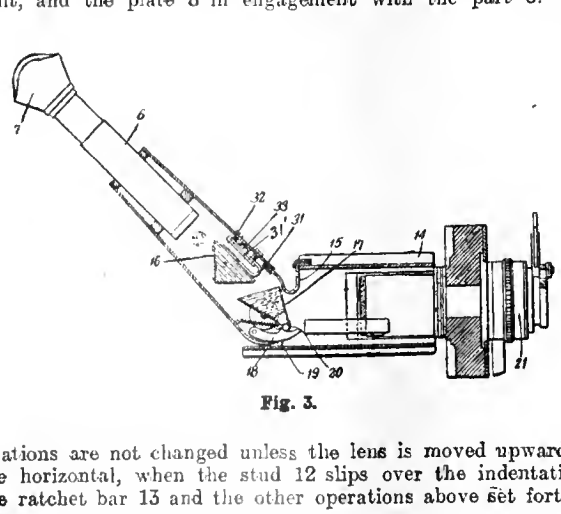


Fig. 3.

relations are not changed unless the lens is moved upward from the horizontal, when the stud 12 slips over the indentations in the ratchet bar 13 and the other operations above set forth take place.

If the operator is in an elevated position and desires to photograph objects below or beneath him, he turns the camera through a great or less angle and brings the eye-piece as near the vertical as need be, when it will be locked by the stud 12 against downward movement. By then looking down into the eye-piece an object may be followed from a point nearly vertically below to a point horizontally in front, as the necessary movement of the camera is permitted by the ratchet bar 13 without any change in the position of the eye-piece. If the camera is to be moved in the direction which is normally opposed by the ratchet 13, the stud 12 may be lifted to prevent this to be done without difficulty.

A camera equipped with the invention is capable of use under all imaginable conditions with the minimum of trouble and difficulty. An aeroplane may be photographed in flight from a trench, a street scene may be photographed from a window, or similar operations performed without requiring the operator to assume inconvenient and difficult attitudes for the purpose of keeping the object photographed in the centre of the field of vision.—Carl Ethan Akeley, 244, West 59th Street, New York.

All-Metal Roll-Film Spools.—No. 172,399 (September 3, 1920). Hitherto it has been usual to slot the roller of a spool for the reception of the tab on the end of the film wound thereon. The object of the present invention is to provide a more effective means for receiving the tab, so that it will facilitate the insertion of the tab, and will then offer a firm resistance to its withdrawal during winding or unwinding, while permitting of a free withdrawal of the tab when the film has been unwound completely.

According to the invention the metal roller is provided with one or two inturned lips along the slot. The roller is preferably formed by rolling sheet metal into a cylindrical form so that the adjacent edges of the seam are interlocked, except where the metal is cut to form the slot, the edges along the slot in one form both being turned inwards so that they form a V-shaped recess. The edges may touch one another at the bottom of the recess. They thereby form salient grippers which tend to grip the tab of the film inserted between them, especially when it is wound on the roller, while they enable the tab to be withdrawn freely when the film is completely unwound and the tab is pulled radially out of the slot. The two lips need not be radial, but may be set or inclined towards one side especially when the roller is intended to be mounted on a spindle.

The form of the lip, or of each lip when two are used, may be variously modified, for instance, it may be straight or curved or straight for a portion of its depth and curved for the remainder, so as to render it more resilient. One lip may be curved and the other straight. In a simple form a lip may be formed by simply extending one edge of the slot under the other.

The roller is preferably provided with flanges which are placed on the ends of the roller which are first beaded, and then spun over, plugs of stamped sheet metal being forced into the ends of the roller to lock the flanges.—William George Temple and James Henry Wilkes, both of 80, Malden Road, Kentish Town, London, N.W.5.

Cinematograph Projection Screens.—No. 170,739 (January 15, 1921). A screen of canvas is mounted on an open quadrilateral frame provided along each side with a projecting flange over which the material is stretched. The flanges are arc shaped, to present a convex supporting surface for the screen material whereby concavity is imparted to the latter. Adjustable tension devices are provided to enable the material to be stretched to the desired degree.

The stretching of the canvas is conveniently effected by means of a series of screw tensioning devices in the form of turnbuckles each connected at one end to a frame member and at the other end to the sides of the flange, whereby the flanges may be tilted outwards or transversely of their length about their bases and thus stretch the canvas.—James Styles, 11, King's Drive, Whitley Bay, Northumberland.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

Kristal.—No. B416,794. Photographic dry plates. The Let Photo Materials Co. (1905), Ltd., 1, Crutched Friars, London E.C.3, photographic manufacturers July 8, 1921.

Iko.—No. 418,227. Photographic plates and films included i Class 1. Ilford, Ltd., Britannia Works, Roden Street, Ilford Essex, manufacturers of photographic plates, paper and films September 2. 1921.

Meetings of Societies.

MEETING OF SOCIETIES FOR NEXT WEEK.

Monday, January 16.

Accrington Camera Club. "Many Things." W. Bell.
Birmingham Phot. Art Club. Annual Exhibition.
Bowes Park and District P.S. Annual General Meeting.
Bradford P.S. Yorkshire Photographic Union Night.
Dewsbury P.S. "How a Reflex Camera is Made." W. Butcher & Sons.
Forest Hill P.S. "A May Holiday at the Lake of Geneva." W Sanderson, J.P.
Glasgow and W. of Scot. Am. P.A. "Ancient Egypt." J. Farquhar Mathieson.
Kidderminster P.S. Leicester Travelling Folio.
Leeds C.C. "Flashlight Photography." F. Millard.
Southampton C.C. "Amateur Photographer" Prize Slides.
South London P.S. "Flashlight." E. W. Taylor.
Stalybridge P.S. "Lancashire and Cheshire Photographic Union Prints.
Wallasey Amateur P.S. "Picture Making with the Camera." E. Knowles.
Walthamstow and District P.S. "With Allenby Through Palestine with a Watch-Pocket Carbine."

Tuesday, January 17.

R.P.S. "Automatic Methods of Cinematograph Film Processing." H. V. Lawley.
Belfast C.P.A. Camera Club. "Through the Grecian Archipelago," with Butcher's Pressman Reflex Camera.
Birmingham Phot. Soc. "The Humour and Pathos of London Streets." A. H. Blake, M.A.
Cambridge Photographic Club. Address. T. H. B. Scott.
Exeter Camera Club. Annual General Meeting.
Hackney P.S. "Through the Grecian Archipelago." W Butcher & Sons.
Morley Phot. Soc. "Mounting Prints." Messrs. Walsh and Spence.
Nelson P.S. "Pictures, Painters and Photographers." T Lee Syms.
Nottingham Phot. Soc. "Paget and other Colour Processes." Mr. Unwin.
South Shields P.S. "Prose and Poetry of the Crooked Line." A. R. Richards.
Stalybridge P.S. "Many Things." W. Bell, of Criterion, Ltd.
Tunbridge Wells A.P.A. "Amateur Photographer" Prize Slides.
Tynesido P.S. "Preparing the Exhibition Print." Easten Lee.

Wednesday, January 18.

R.P.S. "Faces, Famous, Fair and Funny." Walter Stoneman, F.R.P.S.
Accrington Camera Club. "From Basrah to Baghdad, with a Peep at Babylon." Capt. H. Holloway.
Birkenhead Phot. Assoc. "Supernormal Photography." A J Stnart.
Borough Polytechnic P.S. "Elementary Trimming, Mounting and Passe Partout." R. S. Beck.
Catford C.C. "A Tale of Two Cities." H. Creighton Beckett.
Dennistoun A.P.A. "The Phenomena of Supernormal Pictures." G. Garscadden.
Edinburgh P.S. "Printing." J Wanless. Also Lantern Slide Competition.
Halifax Scientific Soc. "Through the Grecian Archipelago." Butcher & Sons.
Ilford Phot. Soc. Competition Night.
Leeds Camera Club. Annual Dance.
Partick Camera Club. G. and F. Union Lantern Slides.
Rochdale Amateur P.S. "Many Things." W. Bell.
South Glasgow C.C. Visit to Dennistoun A.P.A.
South Suburban P.S. "The Value of Failure." E. C. Perry.
Tunbridge Wells A.P.A. "Through the Grecian Archipelago and the Near East." W. Butcher & Sons.

Thursday, January 19.

Gateshead Camera Club. Seltona Demonstration.
Hammersmith (Hampshire House) P.S. "Coins and Medals." Cecil Thomas, R.M.S.
Wimbledon and Dist. C.C. "Pin Hole Photography." B. J. Rose.

Friday, January 20.

R.P.S. Pictorial Group. "Ideals and Methods in Pictorial Photography." Miss Violet K Blaiklock.
Wombwell P.S. Lantern Lecture.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, January 10, the President, Dr. G. H. Rodman, in the chair.

A discussion, arranged by the Scientific and Technical Group, on the desirability of a numerical rating of contrast for commercial printing papers, was opened with a paper by Dr. B. T. J. Glover, read in the unavoidable absence of the author, through influenza, by Mr. K. C. D. Hickman.

Dr. Glover considered the question on the one hand from the sensitometric standpoint, and on the other in respect to the commercial practicability of publishing constants of a printing paper which might be determined as a measure of contrast. He set forth the four measurements which might be made of a printing paper in order to provide information of its contrast quality in printing, viz., gamma infinity, exposure range, maximum density and "rendering power," the last named being the constant representing the straight line portion of the H and D curve of a paper. By exposure range he meant the ratio of the two exposures, one of which gives the lightest tone on the paper and the other the deepest black of which the paper is capable.

He pointed out that no one of these constants is sufficiently descriptive of the contrast quality of a paper. Moreover, the exposure scale and maximum black yielded by a paper were subject to irregular variation in practice according to the character of the negative. He regarded the gamma infinity as an essential constant. This and the exposure scale were the minimum requirements for the indication of contrast quality, the other two being optional. But the measurements were not easy to make, and it was to be feared that they would be considerably altered as the paper progressed with keeping towards staleness. Moreover, it was possible that competitive advertising would impair the accuracy of any measurements.

Dr Glover put forward with considerable diffidence the alternative scheme of establishing a multiple test negative consisting of several negatives of different degrees of contrast. A print (on the paper) made from this negative would perhaps mark one or other of six degrees of contrast sufficiently sharply to allow of a paper being given one or other of six contrast markings. Whatever method was adopted it was necessary that the indication should represent development of the paper to gamma infinity. Such a marking would then, perhaps, contribute to the more thorough development of papers, and, further, would show the advantage to be gained by development on the factorial system.

A contribution to the discussion by Mr. J. R. Hall, of Liverpool who also was unable to be present, was read by Mr. Bloch. Mr. Hall expressed the view of the quantity producer of photographs, as, for example, in the printing of amateurs' negatives, and maintained that a numerical rating of printing papers for contrast was highly desirable.

Mr. J. C. Warburg thought it possible that manufacturers could agree to apply uniformly certain figures or symbols to papers possessing definite degrees of contrast.

Mr. F. F. Renwick further emphasised the points raised by Dr. Glover. There was, he said, no technical or commercial objection to stating the exposure range of a paper. But in the absence of the additional information respecting the gamma of the paper, the statement of exposure range would be misleading as a means of judging from the published figures the degree of contrast which prints would yield. In illustration of this, he showed two prints of very different contrast made from the same negative and on papers having identical exposure ranges but differing in their gammas. Mr. Crossley, Dr. Slater Price, and Mr. Hickman further took part in the discussion, the latter endeavouring to harmonise the views of users and manufacturers, and suggesting a qualitative indication of contrast quality which the latter might give.

Mr. A. F. Keeling then gave a demonstration of the properties of ultra-violet light, and showed the remarkable fluorescence of a number of substances including ordinary vaseline. He incidentally illustrated the strong absorption of ultra violet rays by aesculine and the new Ilford Aviol dye.

At a late hour Mr. Murriott, of the General Electric Company, gave a description and demonstration of a new projector type of gas-filled Osram lamp. This was a very recent development of the G.E.C., and was being made in a series of powers and for a range of voltages by use of a suitable resistance. The makers had

specially considered the life of the lamp, which was about 500 hours. The lamp is of upright tubular pattern, having the filament arranged either as a flat grid or in shallow crescent or bunch form. As demonstrated, a small lamp gave an excellently even and brilliant projection, and evidently was very well adapted for both enlarging and lantern work. The price of the model shown was 12s. 6d., exclusive of the necessary fitting and resistance.

Votes of thanks were accorded to authors, readers and demonstrators who had contributed to the proceedings

CROYDON CAMERA CLUB.

Mr. C. M. Thomas, M.A., lectured on "Chemical Methods in Photography," starting with the French Revolution of the 18th Century, a very heady time. The administration originated the present metric system, and it was not its fault that the one-ten-millionth of the earth's quadrant from the North Pole to the Equator has turned out to be not exactly coincident with the metre, with all apologies to the genial lecturer, who seemed to impute the contrary.

In a very clear and interesting way he then dealt with the metric system, and contrasted it with English weights and measures, which were referred to most unkindly. Still it was comforting to hear that they are good enough for photographers, if the inference be not altogether flattering to the fraternity.

The formula for chromium intensification given in the current "B.J. Almanac" was given as an admirable example of what to avoid. The original formula was far better, as the proportions were obvious at a glance, and useful as a basis for making up working solutions. It must be recorded, even if it reduces the sale of future Almanacs to the vanishing point, that the members generally agreed with Mr. Thomas.

He next dealt with the convenient "10 per cent." solutions, which he said are compounded by dissolving one ounce (the despised "avoir.") of the chemical in water to make nine fluid ounces. Under severe cross-examination he confessed a further 55 minims ought to be added for complete and satisfying accuracy.

This statement started a most amusing rumpus, the dear old 10 per cent. controversy cropping up once again more alive than ever. Mr. Jobling was scandalised and shocked at the idea of the above proportions being considered a 10 per cent. solution, and advanced cogent reasons to the contrary. Observing the "office boy" all smiles, he pointedly drew the attention of the Chair to the phenomenon, and hotly declared that ridicule was not argument. An energetic disclaimer from the one reproved followed, who, however, expressly reserved his right to smile on all appropriate occasions. Then, with the ground cleared, the two set to in earnest, the lecturer, perfectly conscious that he had tripped, discreetly remaining in the background. In vain Mr. Jobling tried to entice the office boy into 10 per cent. admissions, but all he could extract was a statement that the proportions given indicated one grain of the solid in every 10 minims of solution. Watching his opportunity the lecturer sprinted for the next topic, and was at once accused by the valiant extra-turn of "crawling out of the pit he had dug." "Easily done, as it is a very shallow hole," neatly replied Mr. Thomas, and thenceforth was left in peace.

A number of instructive tests and experiments followed in relation to photographic procedure. Speaking about indicators, he had a strong preference for methyl orange and phenolphthalein over litmus. By mixing a trace of the phenolphthalein with sulphite solution he showed that any alkalinity is detected by the solution turning red, which can be neutralised by the cautious addition of a 10 per cent. solution of hydrochloric acid (dangerous ground again) till the solution turns white. Amidol in alkaline sulphite solution is apt to cause fog; and this simple procedure, he said, will be found of service. Among many other practical tips was mentioned the efficacy of mouth operated pipettes, with cyanide solutions for all weary of life. Also, that solutions of metabisulphite should never be boiled, and the crystals kept from contact with air so far as possible.

In answer to a question he said that bringing neutralised sulphite (Piper's formula) just to the boil as advised, possibly caused a double salt to form, which might add to the keeping qualities of the solution. A most hearty vote of thanks was accorded Mr. Thomas for an evening altogether excellent.

Commercial & Legal Intelligence.

LEGAL NOTICES.—Notice is given of the dissolution, by mutual consent, of the partnership between Henry Charles Mahoney and William Dimsdale Stocker, carrying on business as photograph trade workers, at 35s, Duke Street, Brighton, under the style of Mahoney & Co. All debts due to and owing by the late firm will be received and paid by William Dimsdale Stocker.

Notice is given that the creditors of the Oxford Optical Company, Limited (which is being voluntarily wound up), are required, on or before February 14, 1922, to send particulars of their debts or claims to Henry Johnstone Veitch, 56, Moorgate Street, E.C., the liquidator of the company.

NEW COMPANIES

I. J. SMITH, LTD.—This private company was registered on December 31, with a capital of £400 in £1 shares. Objects: To carry on the business of manufacturers of and dealers in photographic appliances, etc. The first directors are: I. J. Smith, 162, Conybere Street, Birmingham, drug merchant; F. C. Harrison, 16, St. John's Road, Harborne, Birmingham, chemist. Qualification: One share. Registered office: 162, Conybere Street, Birmingham.

C. S. YEATES, LTD.—This private company was registered on December 29, with a capital of £6,000 in £1 shares. Objects: To carry on the business of engravers, photographers, photographic printers, manufacturers of films, magic lanterns, and all machinery and appliances required or used by photographers or cinematograph proprietors, etc. The subscribers (each with one share) are: A. J. Hull, 30, Castleton Road, Goodmayes, clerk; M. G. May, 102, Powerscroft Road, Clapton, E., clerk. The subscribers are to appoint the first directors. Remuneration as fixed by the company. Registered office: 14, Hatton Wall, E.C.

BAKER'S ILLUSTRATED GUIDES, LTD.—This private company was registered on January 2, with a capital of £2,000 in £1 shares. Objects: To carry on the business of advertising contractors and agents, printers, engravers, photographers, billposters and agents, etc., and to adopt an agreement with H. A. Fry. The first directors are: R. A. Tuckey, 130, The Avenue, Tottenham; P. E. Lavell, 59, South Side, Clapham Common, S.W.; C. Gibson, 28, Alcester Crescent, Upper Clapton; C. J. Marshall, Chiltern, Gloucester Road East, New Barnet; J. J. Gillan, 189, Mount Pleasant Road, Tottenham. Qualification: £250. Remuneration as fixed by the company.

T. DUNNILL SYKES, LTD.—This private company was registered on January 4 with a capital of £7,500 in £1 shares (5,000 5 per cent. cumulative preference). Objects: To take over the business of photographers, colour printers and lithographers carried on by T. Dunnill Sykes and E. D. Galpin at Bank Chambers, 329, High Holborn, and elsewhere, as "T. Dunnill Sykes." The first directors are: T. D. Sykes, 3, Compton Avenue, Brighton, Sussex; E. D. Galpin, Connaught Hotel, Leinster Square, W. (both permanent, subject to holding 400 shares each). Qualification of other directors, £50. Remuneration, as fixed by the company. Registered office: Bank Chambers, 329, High Holborn, W.C.1.

JAMES ENGLISH AND CO., LTD.—This private company was registered on January 3, with a capital of £20,000 in £1 shares. Objects: To take over the business of manufacturers of card and cardboard, and paper merchants carried on at Peerless Works, Radsworth Street, Baldwin Street, City Road, E.C., and elsewhere, as "James English and Co.," and to carry on the same and the business of manufacturers of mounting and Bristol boards, photographic mounts, etc. The subscribers (each with one share) are: Mrs. K. M. English, 122a, St. James' Court, S.W.; L. E. Giffen, 81 and 87, Gresham Street, E.C.2, solicitor. The first directors are not named. Registered office: Peerless Works, Radsworth Street, Baldwin Street, E.C.2.

STEREOSCOPIC EXAMINATION OF BANK-NOTES.—A writer in one of the evening papers advises the use of the stereoscope for detecting bogus bank-notes. A known good note and a suspected one are placed side by side in the rack on top of the usual binocular view, carefully adjusted and focussed. The examined parts seen under the lens should, of course, appear as one picture. If the two notes do not coalesce, then there is something wrong.

News and Notes.

MESSRS. J. H. DALLMEYER, LTD., of Carlton House, 11d, Regent Street, Piccadilly Circus, S.W.1, advise us that a camera bearing the following description was stolen from their stand at the exhibition held by the Physical Society and Optical Society at the College of Science and Technology, Exhibition Road, South Kensington, on January 4 and 5, 1922:—Quarter-plate double extension folding pocket camera, fitted with 2 Series V Dallmeyer Perfac lens, No 95130, fitted in No. 0 Universal shutter. They will be pleased to hear from anybody who may have such a camera offered to them.

THE ROYAL ACADEMY WINTER EXHIBITION.—This is a show of works by recently deceased masters of the British School. It is a sweet, refreshing breath from the days of our youth when men used to do their best, and it comes across present-day arid sophistication and affectation with a promise for the future. All who are tired of the futilities of modern painting which abjures nature, and craftsmanship and accomplishment and feeling, should go to this exhibition and see again how wrong are the critics who maintain that a picture which has a subject is necessarily negligible. The gorgeous colour and truth of the Stotts are alone worth a visit.

THE LATE DAVID BACHRACH.—We regret to see announced in the American papers the death on December 10, at the age of 76, of Mr. David Bachrach, a pioneer of portrait photography in the United States, and the head of the well-known Bachrach studios in New York, Baltimore, and other towns. Of German birth, Mr. Bachrach began photography when a mere youth at about the beginning of the Civil War, and took a portrait of Abraham Lincoln in 1863. For a time he was a photographer at Fort Gilmour, and afterwards was in charge of surgical photography at a hospital. He began business for himself at Baltimore in 1869, and throughout his career was constantly experimenting in the improvement of photographic processes. He was a co-worker with Louis Edward Levy in the production of the half-tone screen, and himself invented a method of making prints on painters' canvas and of preparing a paper in which the gold was incorporated in the sensitive coating. Apparently he was the first man to make such self-toning paper, although by a different method from that afterwards adopted for emulsion self-toning papers. He was a prolific contributor to the American photographic Press years ago, and was instrumental in exposing many of the fraudulent secret processes largely offered in those days. Until the end of his life he took an active interest in the general well-being of photographers. One of his last successful campaigns was that undertaken two years ago for the removal of photographs from the proposed list of articles which should bear a luxury tax.

A PROFESSIONAL PHOTOGRAPHER'S EXPERIENCES.—An "Evening News" representative has been having a talk with Mr Walter Stoneman (J. Russell & Sons, of Baker Street, W.), who has now an exhibition of seventy-four portraits, "Men of Mark," at the Royal Photographic Society. It seems (says the reporter) that most great men creep to the photographer's studio with reluctance and apprehension. They are more nervous in the presence of the camera than are women, and they arrive anticipating trouble. Mr. Walter Stoneman thinks that many would avoid the camera altogether were it not that they are persuaded *or ordered* by their wives and daughters to give a sitting.

"The most common obstacle I have to surmount is that the male sitter will think of one as an operator," says Mr. Stoneman. "They class my studio with the dentist's surgery and the surgeon's theatre. Though the head-rest is a 'back number,' they behave as if it were still there. One would prefer to have a talk with them beforehand, and indeed I try to do that, but the big men are invariably too busy to give me more than ten minutes—and in that time I must get a characteristic likeness and a pleasing portrait.

"It is fatal to handle your sitters: you must get your pose by suggestion and capture a fleeting expression. Bishops and actors are easy, being accustomed to adopting reposeful attitudes. I have found men of science simple too: strength has come to their faces through study, and the character remains on the surface.

"The difficult man is the modern hustler—a nervy man who seems to live on wires. His appeal to our senses is largely through his vigour; the essence of his impressiveness is in his movements. It is astonishing to find that from the photographer's point of view the hustler is invariably a dummy in repose. The light of action gone from the face, there seems to be nothing left. A very mobile face presents difficulties, too. A certain admiral has a very mobile mouth. In repose something happens to that mouth which seems to definitely rob the camera of a true likeness. I exposed seventeen plates before I caught a good portrait.

"Their nervousness apart, I consider men easier to photograph than women," he said. "A man indicates his character in his face more than a woman does. A woman carries something I can't define—but it's elusive."

Correspondence.

*** *Correspondents should never write on both sides of the paper.*
No notice is taken of communications unless the names and addresses of the writers are given.

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

To the Editors.

Gentlemen, I have received a form of application for membership of *The Professional Photographers' Association of Great Britain and Ireland, Ltd.*, which is headed by a request that I shall fill it in and return it to the Secretary.

I find that if I sign it I bind myself to the statement that I am eligible for membership under Clause 5 of the articles of association, and also that I agree to be bound by the memorandum and articles of association of the said Association. I am, of course, aware that the new Association is a reorganisation of the old P.P.A., and I am also aware that the incorporation necessarily involved an alteration of the old rules, but, as the management has not seen fit to communicate to the members what the new conditions and obligations are, I can only view the request for my signature as one equivalent to asking me to hand them a blank signed cheque. I have always understood that the business of the Association was conducted by a Council of men well acquainted with business procedure, but this invitation to the old members to take a leap in the dark is certainly not indicative of any knowledge of correct business methods. I do not suggest that there is any want of straightforwardness, but those responsible for the issue of this little bond we are expected to sign without inquiry would find it difficult to defend themselves from a charge of lack of the sense of humour; for I read in the little Handbook, issued periodically to members, containing much sound information on the conduct of business, this advice which meets the case exactly:—

> "Members should be extremely careful not to sign any paper before reading it word by word, and making certain that they understand precisely what it commits them to. A signed document cannot be set aside at law, and the literal statements made therein cannot be disputed on any grounds whatever."

Since the war there seems to be quite a different spirit in the management of the Association. Formerly, there may have been some want of enterprise, but the policy was a safe one, and whatever was attempted was carried out. Now the reports of the proceedings of the Council seem to show a tendency to make extensive changes to decide upon great enterprises without due consideration as to whether they can be successfully carried out, and to claim great efficiency in the ordinary routine work, a claim that in my experience is entirely unjustified. We used to have a quarterly "Circular." That publication ceased long ago, and we were promised in its place a monthly publication, which was to be of real importance, with advertisements and all the rest of it. It is still in the land of unfulfilled promises. Now, I see the Congress is to be the subject of an experiment. The advantage of holding it in connection with the Photographic Fair at the Horticultural Hall, which I understand we had our accommodation free, and at a convenient time of the year for most photographers, is to be abrogated, and the next Congress is to be held at an inconvenient

time of the year for many, at a place which will have to be rented at considerable cost, and which will certainly be without the attractions that the Fair offered in the opportunity of viewing the apparatus and materials there to be seen. I cannot conceive that the change can make the Congress more successful than its predecessors, but I can quite conceive the possibility of a very desperate failure.

It would be interesting to know why the well-honoured old title of the Association was changed to its new, lengthy and, indeed, clumsy form.

AN OLD MEMBER P.P.A.

THE P.P.A. CONGRESS.

To the Editors.

Gentlemen,—I read with interest the letter from Mr. H. L. Kettle in your last issue.

The Council of the P.P.A. seem to have acted in rather an autocratic manner in the alteration of the date and meeting place of the annual congress. There was no suggestion of considering the convenience or interest of the members, for as far as one knows no dissatisfaction had been expressed with previous arrangements. The date was without doubt the most suitable for the majority of provincial members.

The rank and file of the P.P.A. members have actually very little to say as to the conduct or policy of the Association. There is a tendency on the part of officials to keep ordinary members in their places. At congress meetings, lectures, etc., Council members only are asked to take the chair, to move or second votes of thanks. In fact, there is a trifle too much of the spirit evinced on the occasion of the visit to the Guildhall last year, when ordinary members were told that "Front seats were reserved for members of the Council only," and later were asked to remain inside the Guildhall until the Council had been photographed, and then were allowed to come out for the general group.

Generally speaking, however, the arrangements were good and well carried out. I am personally quite disappointed that the alteration has been made, as I shall in all probability be deprived of what has been a keenly anticipated and pleasant holiday.—Yours faithfully,

GILBERT N. FUTCHER.

Palmerston Road, Southsea.
January 9.

To the Editors.

Gentlemen,—Your Scarborough correspondent is certainly wholehearted in his disparagement of the Council of the P.P.A. I was very sorry to read such sweeping depreciation by a fellow member. Surely he is suffering, as I am, from the reaction of the strain of Christmas rush, but it affects its victims differently. Whilst disclaiming to be a grumbler, one cannot find any other sentiment in his letter. He has not a word of praise for the Association, and he may discover that the bulk of members do not think as he.

Being a "seasider," a congress in September will be far less convenient to me than in April as heretofore, but I shall make my arrangements accordingly. It would be a sheer impossibility for any organisation with a widespread membership to fix its dates so that they were absolutely convenient to everyone. We all have to make some sacrifice to be present.

I have no more information than your correspondent of the reasons the Council have for fixing on the month of September for this year's Congress, and think it a courageous thing to do, but I have sufficient faith in the wisdom and busines acumen of the men who act for us as a Council to know that they would not rashly jeopardise its success without careful consideration and without an object which they regard as greatly to the advantage of the Association and the members of the Congress.

The alteration of date may or may not prove a success, but, at any rate, the Council is entitled to our confidence. If it is not a success, your correspondent will have the satisfaction that it was no fault of his.

The London members seem particularly in his disfavour by his implication that the date is altered for their convenience. Has he overlooked the fact that the Council consists of an equal number of country members? He refers to the increased cost of membership. I recall that this is not attributable to the Council.

It was the members of the Association at the annual general meeting who doubled the subscription, as it was imperative, and the increase met with general approval.

Yet he complains that he does not get a "Circular" more frequently, and that members are not getting enough for their money. I cannot agree with him. If membership of the P.P.A. is not worth a subscription of 10s. a year, it is not worth anything.

Surely the tendency of thought nowadays should be less of "what do I get out of it." It is a true adage that "we get what we give." The Association reports show frequently that some member or other is being helped very considerably, and in such a manner as he could not help himself. If your correspondent has not had reason to receive the help and advice which are always available, it may even yet come his way.

We cannot afford splendid isolation in these days, and I should like to pay my tribute to the self-sacrificing work of our Council, and the unstinting comradeship and goodwill, which are invariably the predominant features of the Association in congress. Those who attend know.

Meanwhile I hope your correspondent will take a more hopeful view of the future of the P.P.A. and its probable longevity, and will continue his membership. Pardon such a lengthy trespass on your space.—Yours very faithfully,

OSCAR OWERS.

51, Fawcett Road, Southsea.
January 9.

To the Editors.

Gentlemen,—I was very glad to see Mr. H. L. Kettle's letter in your publication of January 6. It entirely expresses my views, and no doubt quite a considerable number of country members of the P.P.A. I have been a regular attendant at the Congress for a number of years, and although a little business has been lost through being away from the studio a week each April, I am more than certain I have gained in many other ways. I contend that April and May are the best months to hold the Congress; it is just the time of the year when we have our "spring cleaning,' are renewing our stock of mounts, etc., and desire to meet photographers and talk things over. The lectures and debates are very valuable in many ways, and I personally have gained valuable hints and ideas which have been put to advantage during the season. September for the Congress is entirely out of the question for the seaside photographer, as that is one of *the* months.

If the Congress is held in September I shall be unable to attend, but shall come to the Fair as usual. Was not last year's attendance at the Congress a record? The number of members who attend each April/May ought to convince the Council as to the best time of the year for a Congress.—Yours truly,

13 YEARS A MEMBER.

COLOUR PHOTOGRAPHS OF STAGE PLAYS.

To the Editors.

Gentlemen,—As I am given to understand that a member of the Liverpool Photographic Society produced some years ago natural-colour photographs of stage plays, taken during the ordinary performance, and by the usual stage lighting, I should feel obliged if you would insert this letter in the "British Journal of Photography," in the hope that it will catch the eye of someone able to give the gentleman's name.

Any information concerning the above, or photographs of like nature, would be extremely valuable, owing to the large amount of interest now being shown by many colour workers in this branch of photography.

It is extremely difficult to understand how such results could have been obtained in pre-war days, as developments in high-speed colour photography, such as improved filters and ultra rapid panchromatic plates, are of quite recent introduction.

Before I attempted my own experiments I discussed the matter with a gentleman very well known in the world of photography, who for the last fifteen years has been in close touch with the majority of colour workers, and he informed me that he had never seen or heard of any results being successful. Although he had

experimented on the same class of subjects his results had been disappointing, and he suggested I had better not waste time or money trying to achieve the impossible.—Yours faithfully,

THOS. J. OFFER.

244, High Holborn, W.C.1. January 9

DYEING SENSITIVE FILMS FOR RELIEF PRINTS.

To the Editors.

Gentlemen,—I was perfectly cognisant of U.S. Pat. 9 0,962, 1911, when I wrote the passage to which Mr. F. E. Ives takes exception. Adopting his gambit, "in the interest of correct historical record," permit me to point out the following data :—

Ducos du Hauron, "La Triplice Photographique et l'Imprimerie," Paris, 1897, pp. 261-263; after pointing out the exceptional circumstances in working the carbon process, particularly the blue tissue, in Algers, du Hauron says: "L'idée me vint, il y a un dizaine d'années, de combattre cette cause d'insuccès en introduisant, soit soit dans le mixtion collide bichromatée, soit dans le bain sensibilisateur de bichromate, une substance colorante fortement anti-photogénique qui, au lieu d'être par elle-même insoluble dans l'eau comme la couleur minérale du monochrome bleu, s'éliminerait complètement par les bains de dépouillement et de lavage. Je fis choix d'une couleur d'aniline soluble dans l'eau additionée d'un peu d'alcool; c'était la *fuchsine jaune*, à l'état de pureté, désignée également sous le noms de *coralline jaune* et de jaune d'or (d'aniline). Cette substance, et il en existe d'analogues, s'acquitta à merveille du rôle que je lui confai; elle favorisa à souhait, sous un autre rapport, la venue de mes photocopies au charbon, et particulièrement du monochrome-bleu, en ce qu'elle permettait d'abaiser, même bien au-dessous des proportions indiquées par les auteur, la dose du bichromate; tant et si bien que nonobstant la forte chaleur de la saison ou j'expérimentais, la lumière ne fouillait jamais trop profondément de celle-ci que ce qui devait être insolubilise. En presence de cette réussite, il me parut de bonne guerre, étant donnée la grande vogue dont jouissaient encore, à cette époque, les phototirages aux mixtions bichromatées, de donner une date certaine à cette trouvaille par le prise d'un brevet. Je le pris le 17 Decembre, 1885 (sous le nombre No. 173,012), et le lassait du reste tomber, peu de temps après, dans le domaine public."

Anglicised, this reads: "The idea occurred to me, about a dozen years ago, to combat this source of ill-success, by introducing, either in the dichromated colloid mixture, or in the dichromate sensitising bath, a substance of a strong non-actinic colour, which, instead of being itself insoluble in water like the mineral colour of the blue monochrome, would be completely eliminated by the development and washing baths. I chose an aniline colour soluble in water with the addition of a little alcohol; it was fuchsine yellow, in a pure state, also known under the name of yellow corallin or aniline gold yellow. This substance, and analagous ones exist, marvellously discharged the rôle which I entrusted it. It assisted as desired, in another respect, the advent of my prints in carbon, in that it permitted the reduction of the strength of the dichromate, even below the proportions indicated by the makers; to such a degree and so well that notwithstanding the great heat of the season when I experimented, the light never penetrated too deeply into the film and did not insolubilise that which should be soluble. In the face of this success, it appeared to me to be fair but, given the great vogue which printing with dichromated mixture would still play at this time, to give a definite date to this work by taking out a patent. I took it out December 17, 1885 (under No. 173,012), and it was allowed, moreover, to fall a short time after into public domain."

The title of the said patent is "Nouveau modes de papiers mixtionnés ou produits analogues pour la Photographie di e au charbon, caractérisé par l'incorporation provisoire d'une teinture."

A. & L. Lumière, "La Photographie des Couleurs," Lyons, 1901; Bul. Soc. Franç. Phot., 1901, Vol. 48, 204, 303, 411: Photo-Rev., 1901, 121, 170, 182; Brit. J. Phot., 1902, Vol. 49, 52; J. S. C. I., 1902, 275; Phot. Woch., 1901, 147; Eder's Jahrbuch, 1900, Vol. 14, 662; 1901, Vol. 15. 272, 545; 1902, Vol. 16, 533; Eder's Handbuch, 1903, Vol. 3, 702; Vidal, "Traité pratique de Photochromie." Paris, 1903, 195.

After describing the reasons for their choice of the carbon process and the inconveniences of the same, MM Lumière state: "La couche sensible se laisse pénétrer trop profondément par la lumière, ce qui fournit des monochromes dont le relief, trop considérable, est un obstacle à la convenable superposition ultérieure des trois images élémentaires. Nous avons remédié a ce défaut en introduisant dans les préparations gelatinées une matière colorant s inactinique empêchant la pénétration des rayons lumineux dans l'épaisseur de la couche sensible. Cette matière colorante doit en outre présenter les qualités, su' antes: elle doit pouvoir être facilement éliminée par lavage: après développement elle ne doit donc se fixer ni sur la gélatine ordinaire, ni sur la gélatine chromée; elle doit, en outre, être sans action sur les bichromatea alcalins. Après avoir essayé dans ce but plusieurs centaines de couleurs, nous n'avons trouvê pour remplir ces conditions que le rouge-cochenille resultant de l'action de l'acide naphthionique sur l'acide β-naphthol disulfonique."

Anglicised, this reads: "The sensitive film is very deeply penetrated by light, which gives mono bromes with very high relief, which is an obstacle to the subsequent convenient superposition of the three elementary images. We have remedied this fault by introducing into the gelatine preparations a non-actinic colouring matter preventing the penetration of the light-rays into the thickness of the sensitive film. This colouring matter ought, however, to present the following qualities: it ought to be easily eliminated by washing; after development it ought not to be fixed on the ordinary or chromated gelatine; it ought, moreover, to be without action on the alkaline dichromates. After having tried in this respect several hundred colours, we have found to fulfil these conditions cochineal red made by the action of naphthionic acid on β-naphthol disulfonic acid."

The Lumière N. A. Company, in 1900, introduced commercially such films in the English market, and I had a finger in the manufacture of the same.

O. Pfenninger, Eder's Jahrbuch, 1909, Vol. 23, 45, says: "Ich fand nämlich dass blaues Pigmentpapier immer zu kräftig und zu kontrastreich arbeitet; dem abzuhelfen, gebrauchte ich ein Chrombad folgender Zusammentse'zung: 5 Teile fünfprozentige Chrom-Pottaschelösung mit Alkali vol. halb neutralisiert und 1 Teil einprozentige Säuregelbloaung. Mit Gelb- und Rotpigment wirkte diese Mischung nicht anders, wie reine, neutrale Chromsalzlösung, hingegen arbeitete das darin sensibilisierte blaue Pigmentpapier flauer, und ich erhielt dadurch ein mit den zwei andern Teilbilder, harmonierendes und besser entsprechendes Resultat. Die Erklarung ist darin zu suchen, dass die Anilinfarbe intensiver färbt und auch die blauaktinischen Strahlen besser zuruckhält, wie das Chromsalz allein."

Anglicised, this reads: "I found that the blue pigment paper always worked too vigorously and hard; to help this, I used a dichromate bath of the following composition: 5 parts of a 5 per cent. solution of potassium dichromate full half-neutralised with alkali and 1 part of a 1 per cent. solution of acid yellow. With the yellow and red pigments this mixture did not act differently to the neutral chromate solution; on the other hand, the blue pigment paper sensitised therem worked flatter, and I obtained a result more harmonious and corresponding better to the other two constitnent pictures. The explanation of this is to be sought in that the aniline colour stained more intensely and held back better the actinic blue rays."

From the above excerpts it is clear :—

1. That Ducos du Hauron anticipated U.S. Pat. 980,962, 1911, by 25 years.

2. That MM. Lumière anticipated the said patent by 10 years.

3. That Pfenninger anticipated it by one year

And Mr. Ives says that this method was "afterwards adopted by the parties named without credit to me."

WHITE'S CAMERA.

Mr. Ives claims to have invented this type of camera, and quotes U.S. Pat. 351,940, 1894. There is an error here as the number should be 351,040. This patent is the same as Eng. Pat. 2,305, 1895, an abstract of which was given in the Patents Chronology, Col. Phot. Supp., 1907, Vol. 1, 24, with figures. From this it will be seen that the Ives patent is for two or three reflectors at an angle of 45 or 22½ degrees to the base, and *all parallel to one another*. White's camera, E. P. 8,663, 1896, and 18,875, 1898, abstracted in the same volume, pp. 32, 40, is for two reflectors only, but *at right angles to one another*. Surely one cannot assume that two or three parallel lines are the same as two at right angles to one another.

Yours faithfully,

E. J. WALL.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

M. E.—The rubber gloves to which you refer are sold by Messrs. Jonathan Fallowfield, Ltd., 146, Charing Cross Road, London, W.C.2.

R. G.—There are no patent rights in the process of mounting a photograph and cutting out the outline of the subject. Trade names for such portraits may have been registered, but, speaking from memory, we do not think they have.

W. H.—The Ives "Tripak" camera has not been on the market in this country, and we are doubtful if it is on the market in America. All you can do is to write for particulars to Mr. F. E. Ives, 1,327, Spruce Street, Philadelphia, Pa., U.S.A.

M. R. B.—Difficult to say from the scanty particulars. We suggest exposure of cards to white light while in the fixing bath or shortly afterwards. Some papers are sensitive in this respect. We shall be glad to advise further on receipt of further particulars of paper, developer, fixer, and manipulation.

X.—We certainly think that the features you describe are a great improvement on the present article and, providing there are not corresponding drawbacks, would largely displace the present pattern. You should protect the invention by patenting or by registering a design. Particulars for either from 25, Southampton Buildings, London, W.C.

H. P.—We have not any knowledge of special investigations, but general experience is that a developing or fixing tank of copper or brass has a very long life in continuous use if the tank be rinsed and wiped dry after use; that is to say not left exposed to air and also to the action of adhering developing or fixing solution. We do not think there is anything in the statement that the effect of brass on developer is to cause chemical fog on the plates. Both brass and metal last longer if nickelled, and if the precautions mentioned above are taken the metal coating remains in its original condition for a very long time.

P. S. P.—Fellowship of the Royal Photographic Society is granted to persons who are already members of the Society and have been so for, we think, at least one year, and in the opinion of the council have contributed in one or other of a number of ways to the advancement of photography. The Society does not set any standard of qualification which must be reached in order that the Fellowship shall be granted. The most that it does in this direction is to issue a statement of the general grounds on which members are admitted to the Fellowship. A copy of this publication can be had on application to the Secretary, 35, Russell Square, W.C.1.

F. B.—Reduction of such extremely fine lines to one-quarter width is a process which taxes the resolving power of a dry plate to the utmost, and we think you will have a great deal of difficulty in retaining the lines, whatever method of working you adopt. There might be some advantage in using a fairly deep yellow filter, but we very much doubt it. We think the most hopeful direction in which to work is to use one of the "fine grain" plates, giving just sufficient exposure to develop up an image without forcing, and then to intensify strongly with the Monckhoven intensifier of silver cyanide. The real fact is that this is a job which requires a wet collodion plate for satisfactory work, and is not the easiest job even with that.

S. J. B.—About sixteen full size burners, either inverted or upright, are needed for taking single figures of a group of two or three at most. For ten figures you would require about three times this number. We should advise you to write to Griffins, of Kingsway, for particulars of the Howellite burners, which are decidedly the best for photographic purposes. The principal objection to gas is the great heat which is generated; much to the sitter's discomfort. For the large groups we should recommend flashlight, using the single figure lamp for focussing. We imagine from your letter that your lenses are not of a very rapid type. It is not much good, if you want to use gas, to work with an aperture smaller than *f*/5.6.

A. F.—We think the change in colour, due to exposure to light or air, or both, is due to one or other of two things. It may be caused by a natural change in the raw base on which the emulsion is coated, although we think it very unlikely that such a change could take place to such a marked extent during the weak light at the present time of year. The other possible cause is that the sulphide solution did not act long enough on the bleached prints to convert every trace of the bleach image into sulphide of silver. If there were a certain small amount of bleach image left in the whites, these would almost certainly change in colour on exposure to light. Therefore, we think the most likely quarter to look for the cause of the trouble is in this latter direction.

E. P. F.—(1) There is now no procedure as a preliminary to creating copyright. According to the 1911 Act copyright is automatically created by the creation of the work. (2) It is not necessary that the word "copyright" should be marked on copies in order to safeguard the copyright in them. (3) Impossible to say if the photographs are of interest to the Press, or to express an opinion from the facts you state as to whom the copyright belongs. It may be the property of either the photographer or the sitter. Fees range from 10s. 6d. upwards. (4) Presuming the copyright is your own, you can grant licences for reproduction in various publications and in various classes of publication, and separately for use as postcards or calendars, in which case it is important that you should not grant any licence which can possibly be interpreted as a complete assignment of the copyright.

M. L.—(1) Amidol is not a practicable method of desensitising plates. We mention it in the "Almanac," because experiments with it were the start of the use of safranine dyes by Dr. Lüppo-Cramer. (2) We have no practical experience of the desensitising properties of triamido-tolnol. (3) You can probably buy from British Drug Houses, Ltd., 16-30, Graham Street, City Road, London, N.1. (4) Potassium permanganate is much too strong an oxidising agent and greatly affects the latent image. It is useless for desensitising. (5) The Kallitype process supplies excellent prints of matt surface and of a range of tones from cold black to purple. From suitable negatives of somewhat good vigour the results are almost as good as those on gaslight or bromide papers as regards gradation. (6) Bichromate solution applied by brush or floating to a paper coated with gum and pigment penetrates not only the gum coating, but the paper support. On exposure to light the more or less insoluble image is formed chiefly on the surface, but not exclusively. We daresay it would be possible to apply the sensitiser to the back of the paper and so obtain rather more insolubilising action in the lower layer of the film, but we do not think the difference would amount to anything appreciable.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3220. Vol. LXIX. FRIDAY, JANUARY 20, 1922. Price Fourpence.

Contents.

SUMMARY.

A competition, in which prizes amounting to £3,000 will be awarded, is being organised for photographs taken with British cameras from negatives on British plates, and printed on British printing papers. On page 29 we specially direct attention to this piece of enterprise, particulars of which will be found on page 42.

A photographic method of producing a newspaper has been inaugurated by the "Blackpool Times," which now is printed by an offset machine, working from metal plates on to which letterpress and illustrations have been photographically printed. The illustrations are thus produced without the aid of half-tone blocks, and, moreover, have a technical quality greatly superior to that obtainable by impressions from half-tones on newsprint. (P. 42.)

The principles and practice of stereoscopic photography of small objects are the subject of a paper by the Rev. H. C. Browne, the first portion of which deals with the general conditions of making and viewing and the design of stereoscope and camera. (P. 34.)

In a contributed article "Thermit" deals with the practical qualities of the retoucher's equipment, e.g., pencils, brushes, knives and mediums, and gives some hints on the proper use of these requisites. (P. 31.)

The Professional Photographers' Association has officially issued a statement of its policy regarding the holding of this year's Congress in the autumn. (P. 37.)

In a leading article we endeavour to bring together a few of the chief considerations which require to be borne in mind in obtaining poses of men and women which are pleasing to the sitters. (P. 30.)

A striking collection of portraits of notabilities by Mr. Walter Stoneman is on view at the house of the Royal Photographic Society, 35, Russell Square, daily, from 11 a.m. till 5 p.m., till January 27. (P. 37.)

The use of an ordinary camera in the making of panoramic prints in sections is the subject of an article by Mr. C. F. Stiles in "American Photography." (P. 33.)

There is evidence that good specimens of the Daguerreotype process are commanding much higher prices among collectors (P. 29.)

A construction of dry-mounting press, designed to obviate injury of the platen through excessive pressure, is the subject of a recent patent specification. (P. 38.)

At the Royal Photographic Society on Tuesday evening last, Mr. H. V. Lawley described the extremely efficient plant designed, made and used by himself, for the continuous development, fixing, washing and drying of cinematograph film. (P. 41.)

Provided a good print is available, a reproduced negative, which is to be printed on a matt or rough paper, may frequently be made with advantage by contact. (P. 30.)

EX CATHEDRA.

Daguerreotypes. We hear that of late good specimens of the Daguerreotype process have been obtaining substantial prices. Although for many years past really good examples of the process have been by no means common, they have commanded only miserable prices. At auction sales we have frequently seen a collection of a dozen or so, including some which were excellent specimens, knocked down at a price which represented a few pence each. But it now appears that collectors of specimens of early processes of fine arts and crafts are taking an interest in Daguerreotypes, with the consequent result of an increase in the price which can be obtained for them. From our own experience in disposing of a small collection left by a deceased friend we have confirmation of this tendency. After having declined offers which did not rise above sixpence or a shilling, we have gradually disposed of the greater number in no case at less than half a guinea each. A really good coloured specimen by one of the early Daguerreotypists of repute, such as Claudet, is worth a good deal more; it may be worth what was charged for it at the time, namely, five or six guineas. Specimens can still be picked up every now and then on the stalls of dealers in odd goods at the Friday Caledonian market. A friend recently showed us a very fine specimen by Claudet which he bought there a little while ago for a penny. In bringing these facts before the many owners of Daguerreotypes who are doubtless among our readers, we must not omit to point out that the glass collodion positive, which by the inexpert is frequently mistaken for a Daguerreotype, has an insignificant value. It is, however, perfectly easy to distinguish with certainty between the two: the back of a Daguerreotype is of copper metal; that of a collodion positive, of glass.

* * *

An All-British Competition. Amateur photographers and the retail dealers who supply them will give an especially warm welcome to the competition in which £3,000 will be awarded in prizes during the present year. For the competition is organised by a group of British firms, and is designed to promote those branches of manufacture in particular with which British firms have been long and honourably connected. At the present time, owing to the economically disturbed condition of almost every country in the world, the difficulties which manufacturers in this country have to overcome were perhaps never so severe, and the firms who have joined with one another in the organisation of this competition are entitled to receive the respect and support of the photographic public for their constructive and enterprising piece of policy. Incidentally, the amateur photographer is given an opportunity of winning one or other of the numerous cash prizes, ranging from £100 to £1, offered in the competition, or rather competitions; for there are two of them, one closing on June 30 and the

second on November 30. These competitions are for photographs taken with one or other of nine different models of British camera on one or other of eight makes of British plates, and printed on one or other of the same number of British papers. Full particulars and entry forms of the competition will be obtainable within the next week or two from photographic dealers throughout Great Britain. It is requested by the promoters that application should be made to the dealers, and that only those removed from the opportunity of obtaining the literature through this channel should apply to the special headquarters which have been established for the competition at 4, Oxford Street, London, W.1.

* * *

Letters to the Editor. Among the features of a trade or technical newspaper those to which many readers invariably first turn are the "Letters to the Editor" and "Answers to Correspondents." We say this, not simply with the idea of paying an uninvited compliment to our readers, but as the result of general observation in respect to readers of the "B.J." and many other papers. Perhaps the "Letters to the Editor" particularly attract first attention, and, therefore, we can thoroughly endorse the remarks recently made by a London evening newspaper on this subject:—"Professor John Adams is right when he says that the readers of a newspaper are like a ghostly committee for carrying new developments. They never meet; they see one another, mostly, only across railway compartments and omnibus gangways and restaurant tables. But though they are a committee without meetings, they do, as the professor says, get things done, and one of their most effective instruments is the Letter to the Editor. If readers knew how very seriously the columns of their Letters to the Editor are examined . . . . . they would be astonished. No reader should believe that a man or woman who writes a letter to the Editor is regarded with hostility in a newspaper office. Every letter is welcomed that has something to say, says it, and then stops.

* * *

Negatives from Prints. When making a negative from a print it is usual to do so either by copying, or if the picture is required upon a larger scale, by means of a contact transparency upon a lantern or other slow plate. A very simple way which dispenses with the need for the intermediate transparency when reproducing negatives, and one that might be more widely employed than it is, is by printing upon a slow or process plate from a good print. The only objection to this method is that the grain of the paper shows slightly in the new negative, but when this can be printed, or enlarged upon a rough surface paper, this is a matter of little moment, provided the grain is not unduly in evidence. A glossy P.O.P. print of good depth, or a glossy bromide print, is about the best for this purpose, and one upon a thin, smooth paper base is, of course, preferable. The exposure is made in an ordinary printing frame with the two films in contact; six or eight seconds at twelve inches from an ordinary bat's-wing burner being about right for most process plates. There is no need to make the paper print translucent; it is a messy job and is of little benefit in reducing the effect of the grain of the paper. Transferotype bromide paper may be of value here. Some time ago we were shown a number of prints from reproduced negatives; instead of the prints in the first instance being made upon ordinary bromide paper, Transferotype paper had been employed, the image transferred to glass, and the new negatives then made by contact. The above method has the advantage of economy in the use of materials over the usual methods of reproducing negatives.

PLACING THE FIGURE.

An apparently simple task, the correct placing of the figure upon the plate, is a rather common stumbling-block for many portrait photographers. The modern practice of trimming the print to suit the subject allows of correction to a certain extent, but very often it is necessary to cut down to a size much smaller than that which was ordered, so that the photographer has either to resort to enlargement or to send out a distinctly inartistic production. While there are no definite rules as to what should be included in a photograph or what position the figure should occupy, any error in this direction is readily perceptible to anyone with a modicum of taste. The portrait may be excellent as far as technique and expression is concerned, but it will never be really satisfactory if this one point is overlooked.

The most common error, and one which many otherwise skilful operators fall into, is that of placing the figure too low upon the plate. The effect is that of dwarfing the sitter or, at least, giving the impression that he is slipping out of the picture. This is, of course, the result of pure carelessness, and is often due to the practice of using lines drawn upon the ground glass to denote the various sizes, instead of having a mask which just includes the area of the trimmed print for each size. The ordinary masks, as used in a repeating-back camera, answer the purpose to a certain extent, but they are necessarily rather larger than the trimmed print; it is therefore better to use a mask of the correct size fixed in contact with the ground glass, the edge of which, being clearly defined, shows the limit of the picture. This device is, however, merely a mechanical aid, and does not make up for lack of judgment. The position of the figure must be chosen to suit the subject. For example, a heavily-built sitter placed high upon the plate tends to appear colossal, while a spare one placed at what may be considered a normal height is apt to look rather insignificant. It is an axiom in portrait work that the physical peculiarities of the sitter should not be emphasised, and that as far as possible each sitter should approach an average size. This may not be high art, but it is what is not unreasonably expected. Thus, in the case of a rather short, stout woman it is not advisable to make a full length portrait, but to make a three-quarter length, ending just above the hem of the skirt. This leaves the total height in uncertainty, and gives the impression of a more or less graceful figure. The subterfuge cannot very well be adopted in the case of a male sitter, so that the difficulty has to be circumvented by taking him sitting.

Bust portraits often have an awkward appearance, which is due to their termination at the wrong point. It may be safely assumed that in neither sex should the picture end at the waist, or in some cases where the waist should be. Nothing is more offensive than truncated arms; either a three-quarter length, showing the hands, or a large head are the only acceptable alternatives. A large head should always be placed so that there is a little more room in the direction to which the face is turned than there is behind. It is, however, affectation to leave half the paper in the front of the face blank, as some self-styled artists have done. With regard to head room, it is not usual to allow more than one-third of the height of the head between the top of the hair and the edge of the print, while many of our best artists allow much less.

With sitting figures the dress must be considered when deciding upon the amount to be included, but as a general rule the cut-off should not be at the knees but well below them.

Full-length and half-length figures must be considered as a whole when it comes to filling the space. If the head is centred it will, as a rule, leave too much behind the figure. It is a great help, not only to placing the figure, but to composition in general, to observe the figure upon the ground glass by means of a small hand mirror, so that the image appears the right way up. By so doing many errors in placing and posing may be avoided. A highly-skilled photographer does not need this aid, but the beginner will find it invaluable. When observing the image direct upon the screen the eyes should not be too near the glass, as faults that would be overlooked at a distance of six or eight inches are readily discerned at twice the distance.

The general appearance of most portraits would be improved were it more usual to subdue the lighting of the lower part of the picture, either by casting a shadow upon the draperies or, as is sometimes done, by using a dark camera-vignetter, which allows the details to be seen faintly. This is done with good effect by some of the most successful portraitists.

Fortunately, we are not now bound rigidly to stock sizes, as in the old cabinet days, and we can often effect a great improvement by cutting the print down slightly, particularly when there is too little space in front of the figure; on modern mounts variations of this nature are not readily noticed. Much may be learned from the work of good portrait painters of the present and past generations, and even if picture galleries are not accessible, reproductions of the works of Reynolds, Gainsborough, Lawrence and, for later work, the illustrated guides to the Royal Academy exhibitions may be procured very cheaply, and for the purpose in hand will answer equally well.

RETOUCHING MATERIALS.

I once knew a retoucher whose complete outfit consisted of a small piece of blacklead pencil, a bottle of home-made medium, a second-rate sable, and a chunk of hard Indian red water colour. The pencil was of no particular quality, and the medium was merely a mixture of rosin and methylated spirit.

To any other skilled craftsman an outfit of this type would be not only useless, but ridiculous, yet it is no uncommon thing to come across retouchers working with tools little better than those I have described. And I must admit that the work done with that particular outfit was excellent. But having admitted that, I am not going to admit that the average retoucher can work under the same conditions without the work suffering, or that my friend's work would not have been even better had he taken an interest in his tool box.

There are many outside this branch of photography who think that a pencil, or a pencil and a brush, are the only things used in retouching, but retouchers of experience know that a very large number of things have their uses. There are so many that we might easily divide them into five classes, viz., pencils, brushes, knives, paints and stains and mediums.

Unless a retoucher is fortunate enough to be restricted to one class of negative on one kind of plate or film, no single kind of pencil will cover everything with full satisfaction. Two or three grades, say 2B, HB, and H, or their equivalents, will nearly always be found to repay the extra trouble in keeping and sharpening. Before the war I do not remember ever seeing anything but loose leads in screw-top holders used for retouching, but when these became scarce, as they did in many places, drawing pencils seemed to become common among retouchers. Of the two, there is little to choose except that the pencils are more easily broken. To prevent this I have found a stiff paper tube very serviceable. It is made by wetting a strip of paper with gum or paste and winding it round the pencil until a tube is formed. The tube is slipped off the pencil and allowed to dry hard before being put into use. For some unknown reason, leads without wood are not commonly stocked by artists' sundrymen, or at least I have always experienced difficulty in obtaining them, and when good pencils can be bought in almost any city street there is not much inducement to ferret about for the uncovered leads. It is possible to strip the pencils and transfer the leads to holders, but unless one is very skilful this may prove a very expensive and irritable process. I have tried Venus, Velvet, Royal Sovereign and Winsor & Newton's pencils with every satisfaction, my choice being more or less for the "Winton" pencil of Winsor & Newton.

There are more than two ways of sharpening a retouching lead, but there are only two which are really expeditious and satisfactory. One is to rub the lead on a solid block of glass paper, revolving it at the same time so that the grinding is done fairly evenly all round. To guard against breaks and to hasten the sharpening a finger tip is pressed on the lead where it rests on the glass paper. The other way, which is quicker and cleaner, is to fold a piece of glass paper and hold it in the left hand with the open edges facing the right hand. The pencil or lead, with about two inches of lead exposed, is held in the right hand, the lead pointing towards the paper. Putting the lead into the folded paper it is worked in and out rapidly and revolved at the same time, the result being an extremely fine point in a very short time without risk of breakage. The glass paper should be fine, and the piece large enough to allow the edges to be turned back over the finger and thumb. This precaution will prevent the lead stabbing one in the case of it slipping from between the folded paper when sharpening rapidly. Through using too small a piece of glass paper I once had my left thumb mottled with points of retouching lead.

The only brushes known to some young photographers are "spotting" brushes. As to just what constitutes a spotting brush they are not always very certain. The brushes sold under this title are invariably short-handled sables, similar to those used in water-colour drawing, and artists' sables are at least as good as anything for this work. Unfortunately, sables of any quality are rather dear; one can pay as much as 2s. for a single brush of a suitable size. Second-quality brushes are cheaper and good enough for most purposes. Siberians, which run about 2d. each, can be used for blocking out, except where there is very fine detail; and with skill these brushes will spot, but for regular work the sable is essential. For filling in masses of opaque when blocking out large negatives, a camel hair mop is very useful, but a common practice is to cover such spaces with gummed paper which will not rub off or abrade other negatives happening to come into contact with it. An uncommon type of brush with retouchers is the stencilling brush that is made for "Florescan" work. With this brush, paint put on to the back of a negative can be stippled or "scrumbled" into the softest of clouds or vignettes. Negatives can be built up in this way, and the printer saved much "dodging." Talking about brushes, the glass brush also has its uses. But this "brush" is more of a knife than a brush, being used for local reduction of density. Then there is the air-brush, which though not like a brush, acts as one. Water colour or dye can be brushed on the gelatine side of a glass negative or on

both sides of a film. On the back of a glass negative thin red varnish can be used if a base of matt varnish is first laid on. But varnish messes the instrument, and if it is used extra care is necessary in cleaning. When air-brushing a negative, the image should be shielded to prevent any spray from reaching it. This is necessary unless one is very expert with such work. The water colour or dye should be fairly strong and the air pressure high to get the best results.

A doubtful point with some spotters is the size of brush best suited to their work. It might appear at first sight that small brushes would necessarily do finer work, but this does not always follow. What is essential is strength and point, and these are often more noticeable in a large brush. But individual taste varies. I prefer a No. 2 for spotting and Nos. 3 and 8 for blocking out. At times I come across a No. 0 which is beautiful for delicate work, but it is not often. For edging a painted vignette, a No. 3 stencil brush is about right. Air brushes also have their sizes, and here I prefer the No. 2 "Colour Spray." A point about all brushes (and pencils, knives, etc.) is the thickness of the handle. It seems usual to make handles in proportion to the hair, lead, or blade carried, instead of to the hand, and I find many handles are too thin altogether to hold for long without inconvenience if not actual cramp. Winding such thin handles with lantern slide binding to increase the thickness of the grip results in better and easier work. I once knew an artist who stuck all his brush handles through pierced corks for the same purpose, though this would be going to extremes for anyone not possessing an obvious fist.

Some retouchers are very particular about their knives. Others seldom or never use one, and when they do their pocket-knives do duty. As it happens, this is a place where the actual instrument is not by any means so important as the skill behind it, and in the hands of an expert the pocket-knife will do better work than a first-class special knife in the hands of a novice. The Bruce retouching knife is well known, and special knives are also made and supplied by dealers; but whatever knife is favoured, to get the best from it it must be kept sharp. Not everyone can sharpen a knife to the required edge, and it may pay to have one's knife seen to occasionally by a cutler. Another factor in knifing is the state of the film. It should be bone dry, and a good plan is to warm a negative before attempting to knife it. For large patches of reduction the glass brush or a dab of metal polish on a bit of washleather will prove easier than the knife. Another dodge is to rub the negative with a mixture of methylated spirit, water, and borax. A pinch of borax in sufficient water to dissolve it is added to about three ounces of spirit, this making a very effective reducer of dry negatives. It can also be used on bromide and gaslight prints. The preponderance of spirit in the mixture precludes any wetting of the gelatine which would delay further work.

The retoucher's palette should not be limited to a piece of hard, black water colour. Lamp Black, Indian Red and Neutral Tint are all useful, and a china palette to carry them is not a luxury. Tube colours are cleaner than cakes or pans, as sufficient for the day only can be put out fresh each day. Black and Neutral Tint will cover all ordinary spotting and vignetting or working up on the reverse side, while the Indian Red is good for very opaque work such as blocking out. The proprietary articles for blocking out are too well-known to need mention here, though I may refer to one which was not primarily intended for the work but is nevertheless excellent. It is Process Black. Any yellow, orange or red dye can be used on a negative, either from a hand brush or an air-brush. Red ink is very serviceable for one. It should be remembered though, that dye is not so easily removed as paint in the case of error. When it is necessary to remove it a weak bath of sulphuric acid will often do the trick.

I have tried most of the made up mediums on the market and found them all useful. They differ in strength and "feel," but will all do the job for which they are intended. When a retoucher complains that a medium is too strong, or not strong enough, it may be that it does not suit his touch and pencil. A softer or harder pencil may be all that is required. Medium can be made fairly easily, but as there are so many kinds of rosin about, and so many qualities of turpentine and other solvents, formulæ are not very decisive. There is no harm, however, in a retoucher experimenting for him or her self if a home-made medium is desired. Good violin rosin and methylated spirit (or better still, rectified spirit) will make a workable medium. Or rosin dissolved in a mixture of turpentine, kerosene and linseed oil, the proportions of which can be varied to give differing mediums, always keeping the turps in excess of the other constituents. Gum sandarac is used sometimes in addition to the rosin, but when mixtures become complicated the question arises as to whether it is not best to buy a ready-made medium instead. Varnishes also can be bought ready for use, ordinary clear varnish being obtainable for warm or cold use. It is not so popular in these days of cheap work as it was in the past, but it has its value, and it is useful to be able to varnish a negative when necessity arrives. Matt varnish is very often useful for giving a working base on the glass side of a negative, and its use does not demand the same degree of care and skill required by clear varnish. With varnishes I will include mucilage, as this has its uses in a similar way. For undoing scratches nothing is so good as a bath of mucilage. Gelatine solution, gum arabic, Seccotine in solution, and other clear gums can be used. The mucilage should be poured into a dish, care being taken to keep out dust or other foreign matter. Bubbles also must be avoided. The negative is slid cleanly under the solution, and once completely covered it is removed as carefully and put to dry in a dust-proof place. If cleanly performed, this operaton will fill in scratches in such a way that the negative can be enlarged from by condensed light without the scratches being recorded. It is rather difficult to avoid bubbles and dust, but if the scratches are severe or numerous this method is better than tedious and perhaps unsatisfactory spotting.

In conclusion, although I have numbered many retouching implements and materials, I have not exhausted the list. But from those I have mentioned I think the enthusiastic retoucher who has not yet reached the highest pinnacle of the retouching art will be able to select a useful outfit.

THERMIT.

REAL "WHILE-YOU-WAIT" PHOTOGRAPHS.—Last Friday the editor of a Walsall newspaper received a parcel of important photographs and process blocks which were posted in Birmingham, nine miles away, in July, 1919.

A LEIGHTON BUZZARD SOCIETY.—About a score of enthusiastic amateurs met at the studio of Mr. E. J. Bacon, at Leighton Buzzard, on Wednesday evening, and decided to form a club under the name of the Leighton Buzzard and District Camera Club. It is anticipated that a beginning will be made with a membership of 30. The executive council, which was elected at the meeting, has premises in view and is at present busily engaged in drawing up a constitution and programme to be submitted to the next general meeting on the 28th inst. The secretary, *pro tem.*, is Mr. George W. Hubbard, Prospect House, Leighton Buzzard.

PHOTOGRAPHIC COMPANIES IN 1921.—The statistics of company registrations at Somerset House from January 1 to December 31, 1921, compiled by Messrs. Jordan & Sons, of Chancery Lane, include three public companies relating to photography having collectively an authorised capital of £1,116,000. In the same class twenty private companies were registered of a total authorised capital of £84,500. The major portion of the capital concerned in the three public companies is represented by that of Amalgamated Photographic Manufacturers, Ltd., registered in February last, with an authorised share capital of £1,100,000.

SECTIONAL PANORAMIC PRINTS.

[The making of panoramic prints of special subjects is work which now and again is required of a photographer. In the following article from "American Photography" Mr. C. F. Stiles tells how to use an ordinary camera for the purpose.]

The making of panoramic exposures is wonderfully simple with the Cirkut camera. This ingenious apparatus revolves on a tripod head fitted with changeable gears engaging a large gear. The detachable gears are so figured as to provide proper speed of travel of the film across the exposure slot. As the focus of the lens changes according to the distance of the objects focussed upon, the diameter of the circle travelled by the film also changes, hence the necessity of a change in film travel, since the time of revolution of the camera remains the same.

A Cirkut camera is not always at hand, and many of us do not have access to such an outfit. It may be necessary to make a panoramic view when only ordinary apparatus is available, but excellent results may be obtained by making sectional views if the photographer has a clear understanding of the principles involved.

As an example, the making of mountain range panoramas is a task we have frequently met with in the past. In winter we found great difficulty in making film exposures because of the dry cold, which produced static electrical discharges on the film whenever it was unrolled with a jerk, as is likely to happen when working under such uncomfortable conditions.

Let us assume that we are standing on a mountain summit of about 6,000 feet elevation. A line of peaks 5,500, 5,700, 5,800 and 5,400 feet high run off diagonally, so that the nearest is a mile distant and the last one about 5 miles away in an air line. The rocks above the tree line are covered with snow and ice, and the base of the mountains is cut off by the receding slopes of the peak we are standing upon.

Experience has shown us that colour-sensitive plates are an absolute necessity, and by using a deep ray-filter we can come much nearer to reproducing the visual contrast between the sky with its clouds and the snow, and also reduce the halation error. We use fast emulsions because the camera is constantly in danger of vibration from wind. The long focus lens gives us proper perspective. The more distant summits are not dwarfed by comparison with the nearer foreground, as they would be if we used a short focus lens.

The axis of revolution of the camera which a novice naturally uses is the usual tripod socket. The proper point for panoramic work is the optical centre of the lens. We meet this condition in practice by using a supplementary bed or board to which the camera is attached, with a new tripod socket under the lens itself. In the case of a double lens of the symmetrical type we find that this should be placed just under the lens, but in case of a single lens combination, it will be in advance of the lens. With a 13¾-inch single Protar the point is 15 inches from the ground glass, or 1¼ inches in advance of the lens.

To find the axis of revolution, take two smooth boards of equal width and mount the camera on one with ground glass perpendicular to the edge. On the central line of the other drive a brad up through, projecting slightly on top. Press the bottom of the camera board down on the projecting brad. You can now move the camera board on the brad point as a pivot.

Focus the camera for distance. An electric light at night is very convenient. Watch the image in relation to the vertical lines on the ground glass while rotating camera on pivot, and if there is movement, lift the board and change its position forward or backwards. By trial and error you will find the right point, and before dismantling you should locate the position of the hole to allow clamping of the camera to the board by another tripod screw.

The camera should then be permanently attached to the top board, a hole made in this board at the correct brad mark, and the tripod screw turned into the hole so as to cut a tripod socket. When the lens is replaced on the camera front, the camera is in panoramic adjustment.

With some types of view apparatus supplied with a supplementary bed one may so adjust this as to bring the lens in its proper position in relation to the tripod socket. A large tripod head gives more rigidity, and a supplementary tripod leg to brace the projecting back overhang of camera may be desirable. While adjusting the camera for panoramic work, the ground glass should be marked with vertical lines about a half-inch from the edges. This is to keep control of overlaps when planning out a sectional exposure.

With the apparatus properly mounted on the supplementary bed, focus on the left section of the view, and note the object which falls on the vertical line at the right. Revolve the camera till this object moves to the left line, and repeat to find out how many exposures will be needed. The parts outside the vertical lines are the overlaps, which we make liberal to guard against defects on the edges of negatives. We must, above all things, have the camera level, or, if impossible, be sure the greatest dip of the camera is in the exact centre of the series. Not much dip is possible if the horizon shows. Otherwise the horizon will run diagonally in the joined panorama, and we will have to sacrifice some width in trimming.

We next decide what exposure to give, as the exposures must be the same on all sections. We can occasionally change exposures, to take care of varying conditions on various sections, but this is not often possible. We find it much better to wait for an even illumination and keep exposure constant. The making of the successive exposures is an easy task, providing we look out for the overlaps, which we check up step by step on the ground glass as we turn the camera.

Development of all the sections is done simultaneously, so as to get the same printing density. This we find exceedingly important in practice. Printing we do similarly, taking one plate and making test exposures till we get the best tone rendering, after which we make a complete set, using the same printing time throughout.

The next step is to make the composite print for copying. The separate prints, which should be on glossy paper, are trimmed carefully so that they exactly match. We like to make one trim on the right edge of No. 1 (left) print, and lay this overlapping print No. 2. When the proper adjustment is made, we mark the under print on both margins with a safety razor blade. Remove the top print and, using a ruler, cut clean across the print, which will give a perfect junction. Repeat until all the prints are properly trimmed.

We have sometimes varied this procedure by tearing the prints irregularly and then rubbing down the paper back of one print till only the emulsion surface shows on the edge. This print is laid over the next one to the proper match, and so on through the whole series.

With the straight cut prints we always stain the edges of the prints which form the junctions. In copying, these come clear if they show at all, a much easier condition for retouching on the copy negative.

We next mount the series carefully on a smooth card, taking great care that the prints are properly butted together. Lately we have used Grippit, a rubber mounting solution, and this has the advantage of ease in manipulation with a minimum of stretching. It is wise to use a very heavy card in paste mounting so as to overcome the tendency of the prints to stretch and shrink.

At this point we spot prints carefully and look up some commercial artist who can put in a bank of clouds in the

sky, besides generally touching up prints. This makes the negative retouching easier.

When the composite print is done we are ready to make a copy negative. If the length of the print desired is beyond your camera capacity, you can probably get a local photo-engraver to make the negative with his large camera. The copy should be made on a slow plate, and where the original composite is made on printing-out paper, we prefer to use an ortho plate and copy with a filter and incandescent electric lights.

The resulting negative can be very effectually modified by flowing some ground glass substitute on the back and strengthening here and there with pencil or crayon.

We took a mountain panorama as our first example because no very near objects are included. The conditions change with very near foregrounds, and here is where the long focus lens has its advantages. When such a condition is met with, we must elevate our lens by the rising front so as to cut out very near foreground. Always avoid long straight lines very near the camera. These will be rendered with different angles in each section, whereas in a Cirkut view we get a constantly changing curve. As the line becomes more diagonal, the distortion effect is lessened.

In distant views made with film cameras, we can sometimes cut the negatives themselves and make a copy negative or an enlargement by projection. In many cases the enlarging process is better and retouching on the enlargement is easier because the treatment can be broader, due to the fact that big prints must be viewed at a greater distance.

Those who do not wish the trouble of making a copy negative sometimes get a picture framer to make a multiple opening cut-out for the various sections. This is a very effective treatment. Care should be taken that the colour of the cut-out harmonises with the print, as some injudicious selections we have seen seem to degrade the brilliancy of the pictures.

With a 7 × 11 view camera we can do some novel stunts, because of the convenience of the sliding lens board. We have in mind one task in photographing a very long group of buildings which could not be taken, even with a very wide angle lens. The temporary clearing of a lot in front of this building gave a free outlook, but the distance we could go back was limited. We found a pile of boards situated conveniently near the centre of the view, giving us a high elevation, so we could cut out the rubbish and cellar pits of the foreground.

Our camera was set up with the plate parallel to the front of the buildings, and by sliding the lens to the limit each way we could catch both ends of the building. Two plates were made, and a vertical line on the building was selected as the cutting point. The joined print, when retouched, was not copied, but used direct as an original for reproduction.

At another time we had occasion to photograph the same group from the roof of a building down the street. The great length of the building along the street we were on made the far end very small in comparison to the nearer parts, while the end of building on the cross street came just the right proportion. We were equipped with a set of convertible single lenses, and used one of quite long focus, with which we made an exposure on the long façade. An enlarged negative of the first plate was made with the corner of building exactly the same height as on the long focus exposure. Junction was made at this point. A building on the opposite corner obscured the lower part of the end exposure, but this was blocked out with Chinese white, and the commercial artist handling the retouching very skilfully faked the hidden windows, as he had enough window ledges showing to get the inclination of perspective lines and the details of construction.

Such work as the above is limited only by the ingenuity and imagination of the worker. The actual task of making a matched series is really very simple with a little practice.

C. F. Stiles.

THE PRACTICAL STEREO PHOTOGRAPHY OF SMALL OBJECTS.

The insertion of the word "practical" into the heading of this article calls for a considerable amount of courage, for no study of this baffling problem can be said to have reached a practical stage until it has provided the photographer with a few simple working instructions or formulæ whose accuracy he can put to the proof as easily as he can test the optical properties of a lens of whose construction he knows nothing. A previous conscientious investigation, on geometrical lines, cleared the ground fairly thoroughly, so far as the theory is concerned, but it left a good many hard fences for the man with the camera to get over before he could reach his goal. It is our present object to remove these difficulties altogether, so far as may be, and to present the matter in a form that will allow the skilled and careful worker to obtain exact results by direct exposure without having to carry out a series of vexatious manipulations of his negatives and prints. The photography of small objects always calls for skill and care, and there is therefore an irreducible minimum of trouble which must be faced. It is on the worker's technical and artistic skill that success will ultimately depend.

A few preliminary observations are necessary in order to define, once for all, the object of our search. It is the photographer's desire to be able to present stereoscopically an image on a certain scale, n, and at a certain distance, x, n and x being variable at his pleasure—say that he wishes to show a small entomological specimen magnified 5 diameters at a distance of 12 in. This obviously takes it for granted that size and distance may, in a real sense, be attributed to the image; otherwise the whole project becomes nonsensical. It will be more absurdity to attempt to measure the width of a mental impression—if that is all we can obtain—in inches and decimals of an inch, as we shall have to do in every case if we are to arrive at any degree of accuracy. The image must, therefore, be assumed to be real, so far as the eyes are concerned, with a definitely measurable size and distance.

The first indispensable condition that must be fulfilled, if this sense of reality is to exist, is that the light should enter the eyes from the various points of the image as from the points of a real object, *i.e.*, that the eyes should be *focussed* and *converged* exactly as in nature, upon the points in space which a real object would occupy. We are setting out in search of a simple, practical method by which such perfectly projected images can be obtained.

The second indispensable condition is that the image should not be presented to the eyes in a way that makes it impossible for the mind to accept it as true. The photographer, here, as always, has two tasks before him: first to perfect his technique, and then to find a perfect medium by which his results may be expressed. The two media with which we have to deal in this case—the two things that come between the observer and the image, constituting a kind of physical obstacle through which he has to project his mind—are the stereoscope and stereo print. There may be individual workers who have a lively perception of the importance of this part of the prob-

...; but it is employing very mild language to say that, as ... known, the stereoscope generally used, and the prints generally furnished, are hardly conducive to accuracy and interest.

The stereoscope almost universally offered to purchasers consists of a squinting, open-frame contrivance, having two segments of large diameter lenses, mounted with their axes inclined to each other, adapted, no doubt, to allow incorrectly mounted prints to be examined without causing brain fever. Wonderfully cheap and efficient, this appliance is ready to accept anything that is presented to it, and make the best of it. It is an old and valued possession of many a stereo enthusiast, which we must not criticise too harshly. But it will be pure waste of time to aim at technical precision, or even to expect any definite result at all, if the prints are to be submitted to a contrivance of this kind. Again, the open frame allows a multitude of other objects to thrust themselves upon the observer's notice in addition to the image; portions of the woodwork of the stereoscope, brightly illuminated; large areas of the room and its furniture; two secondary images—veritable ghosts—one on each side of the true image—all these create a chaos of confused impressions covering the whole sensitive surface of the retina, in the midst of which it is idle to expect the image to assume any aspect of reality. The stereoscopic image is necessarily a very frail thing. Unlike other realities it is dependent upon one sense only, and that only a fixed glimpse from a single point of view; we cannot verify our impressions by moving about and looking at it from a different angle. To project this image, with its more than soap-bubble delicacy, into open space, where it has to rub shoulders with the crowding images of solid objects about us, is somewhat like hanging a canary in a boiler factory in the hope of enjoying its song. There is a clear demand for a box-form stereoscope, with an efficient central partition reaching right down to the surface of the print, so that nothing is visible to the eyes except the true stereo image. The outer end should be closed with a matted glass diffuser for viewing transparencies, and a small door on top, carrying a mirror on its inner surface, would allow ordinary prints to be examined by reflected light. The whole interior should be dead black, and focussing should be at the eye end. This is one of the oldest forms of stereoscope, dimly remembered by the writer from the days of wet-plate photography. It makes a not unpleasing addition to the furniture of a room, and it should be comparatively inexpensive to manufacture.

The stereo prints are usually mounted or made on a white background, which is often highly glazed, and the white border thus left dazzles the eye with its brilliance. This, together with surface reflections, makes it impossible for the observer to forget that he is merely looking at the surface of a flat photograph, possessing some peculiar characteristics which give an impression of perspective relief. The writer had made many dozens of stereo prints before he discovered the virtues of a dark-green mount and a printing paper of smooth but not shiny surface. Even at its best, however, the mounted print can never be a perfect medium, and there is a clear call for the use of transparencies such as more than forty years ago gave wonderful beauty and reality to the stereoscopic image. The great difference in the quality of reflected and transmitted light is not generally recognised. People as a rule are sceptical when they are told that the image of an ordinary candle photographs white against a brightly sun-lit whitewashed wall—that the direct rays of the candle are stronger than the reflected rays of the sun; but the truth of the statement can easily be verified by experiment. Transparencies have the advantage that they not only allow the interior of the stereoscope to be kept in complete darkness except for the light entering through the prints, but they bring this great *compelling power* of direct rays to the eye of the observer. The old difficulty about storing glass transparencies may perhaps be overcome. The flat film, and still more the roll film of to-day, would seem to open out new prospects very tempting to the progressive worker.

There is a third indispensable condition over which, unfortunately, neither the photographer nor the observer has any control. The observer must have good sight. *Realisation* of the result will depend upon acuteness of vision and the sensitiveness of the eyes to variations of distance. When the object photographed is a familiar one and the image is natural size a very powerful aid is given to the observer's judgment. The contents of the image then allow it to tell its own tale, and the mind will readily place it at its proper distance. But when the image is magnified, or is of some object unknown to the observer, the eyes alone have to perform the work of placing the image and deciding its actual size. As the sensitiveness of the focussing and converging accommodations of the eyes is only acute for near distances, and as the difficulty of precision in technique becomes greater for distant images owing to the minuteness of the changes in the prints, these considerations put a practical *space limit* upon success, unless, as stated above, the contents of the image guide the mind to a conclusion. In no case must anything appear that would mislead the eyes, for the mind cannot accept the reality of that which it knows to have no existence. Between the limits of 12 in. and 20 in. there should be, for people with normal vision, a very vigorous estimation both of size and distance, quite independently of all previous knowledge of what the image represents. If too long-sighted or too short-sighted, the observer will not be able to see an image distinctly at, say, 12 in., and he will have to shift the focus of the stereoscope from its proper position. The convergence of the eyes on the points of the image will, however, remain practically undisturbed, and the loss of reality should be no greater than that which results from the wearing of glasses. The children of the family, with their young and flexible sight and unsophisticated minds, will be the best judges of the photographer's success. The tired sight of old age can hardly hope satisfactorily to address itself to the task.

We have had to detail the practical difficulties in a rather discouraging manner—difficulties that are quite external to the photographer, and lie altogether outside the technical and optical part of the problem with which alone the writer is competent to deal. A false optimism here would lead to deceptive theory, and would only result in so disappointing the worker as to cause him to abandon the attempt as hopeless. The drawing up of long tables giving precise distances and sizes of the stereoscopic image beyond the limits to which *under present conditions* they can be realised, without adding a warning notice, is a kind of dishonesty particularly abhorrent to mathematicians. To what degree then may we hope for success? So far as technical accuracy is concerned; so far, that is, as regards the taking of the negative, the preparation of the prints, and the projection of the image, it may be stated with confidence that precision can be attained, and that the inevitable small errors due to mechanical causes will not affect the results in any appreciable degree. The procedure about to be recommended is based upon two elementary and long-established formulæ relating to lenses—one dealing with the photographic lens and the other with the lenses of the stereoscope. It has been verified by innumerable cross references and test cases until no room has been left for doubt. The only assumption made is that the lenses in both cases give rectilinear images and have a flat field. Technical success is therefore certainly within our reach; success itself, within practical limits, which experiment will soon decide, will depend upon the way in which the results are presented to the observer and on his power of visualising them. These limits may be much wider than the writer anticipates. There seems to be no reason why the photographer should be content until by a happy alliance of exact technique and perfect medium he succeeds in producing an image that forces itself upon the mind with a compelling sense of reality.

It will be necessary to tax the reader's patience with a little theory, sufficient to serve as a slender thread connecting the various steps by which we arrive at the working formulæ. Perhaps, therefore, while the dish is a preparing, it may be well to give the worker a bone or two to go on with, in

the shape of some concrete examples of what can be done. Let us turn then abruptly to the photographer's work-room and see with what apparatus he must provide himself. The list is not a long or formidable one.

(1) The optical data given by the stereoscope have such a dominating influence upon the taking of the negatives and the preparation of the prints that no progress can be made in tabulating possible results until a decision has been reached with regard to the focal length of the lenses to be adopted and the separation of the lens centres. For present purposes, therefore, the writer, after some hesitation, has tentatively standardised a stereoscope having lenses of 4 in. focal length, with their centres 2½ in. apart. This gives an image subtending, from side to side, an angle of about 35 deg. with the eye, which will probably be regarded as a pleasant and sufficient field of view. The covering power of the lenses must be considerably greater than this—between 60 deg. and 70 deg.—as for nearer distances of the image the prints will be decentred, and they should have a clear viewing aperture or diameter of not less than 1¼ in. The focussing adjustment must allow the distance between lenses and print to be varied from 3 in. for images at 12 in. to 4 in. for images at infinity, *i.e.*, for landscape prints. Abnormally short-sighted observers will require an adjustment to a distance of less than the above 3 in., which should be provided, if possible. The details of construction must be left entirely in the hands of the practical optician. The actual width of the two prints mounted side by side will never exceed 5 in., and the height, which lies at the worker's discretion, will probably not be greater than 3 in., so that a postcard size print holder would be ample. This stereoscope has the advantage that it is eminently suited for viewing landscape prints taken with a 4-in. lens, and would remove the necessity of having two or more appliances for different purposes.

It is to be hoped that the provision of the above stereoscope will not be too grave an obstacle in the worker's path. In order to be useful effectively, there is no choice but to decide at the outset upon the exact optical details of this instrument to which, in a most real sense, we have to *submit* our prints, and by whose judgment we must abide. If a stereoscope of too long focus is used, the image, unaltered in width, is projected to a greater distance, and its depth is increased. It is opened out somewhat after the manner of a concertina. If the lenses are too far apart the image is brought nearer, made smaller, and distorted. If both errors exist simultaneously the result is utter confusion, and the precise care given to the taking of the negatives is rendered nugatory.

(2) Happily no such restriction is imposed upon us with regard to the next piece of apparatus—the camera. Any small accurately constructed camera with focussing adjustment will do; it need not be greater than quarter-plate, and may be 3¼ by 2½ if the longer side is placed horizontally. Unfortunately this latter size is just too small to allow of its being used vertically, as the decentring of the right and left images on the focussing screen brings one edge of each image right to the edge of the plate. Careful use of the sliding front would obviate this; but it will be far safer for the worker, and especially for the experimenter, to avoid this dangerous complication, which is very liable to lead to error. From the time the camera is focussed on the object and adjusted for the first exposure it is better to regard it as a rigid body, and simply to shift it as a whole parallel to itself through exactly the required distance before making the second exposure. This movement of the camera rather than of the lens alone reduces the amount of sideways shift of the negative on the plate, since plate and lens both move together, and allows a smaller size to be used. When lenses of exactly the correct focal length are available the extension of the camera will never be greater than 4 in., and never less than 3 in., no matter what may be the scale and distance of the required image; but when for convenience lenses of only approximately correct length are used these limits may be slightly exceeded. In photographing very flat objects, such as old coins or medals, it may be desirable deliberately to exaggerate the depth of the image in order to gain greater relief, and in this case a shorter lens would be used—perhaps of only half the calculated correct length—and the extension of the camera would be correspondingly decreased. The above particulars as regards the camera cover not only the few examples about to be given, but the whole infinite range of possible stereoscopic results.

(3) For the following examples a 2½-in. lens will be required This is made to do the work of a 2.4 in., a 2.66 in., a 2.29 in., and a 2.22 in. lens., and the results are therefore approximate. A slight error in the depth of the image is introduced, but the difference is so small that it may fairly be described as negligible. This power of getting practically accurate results with any lens which approximates to the focal length indicated by the formulæ is of great importance, provided it is not pressed too far. It should be kept rigidly within limits so small that it is impossible for the observer to detect distortion.

(4) There is yet one more piece of apparatus the arrangements of which must be left more or less to the ingenuity of the worker. Its object is to give definiteness and precision to his operations just where these qualities are most necessary and most difficult to attain. Some small object is about to be photographed—say, a 2-in. or 3-in. cube. It has to be placed at a certain distance in front of the lens in order that the perspective may be correct; and the resulting negatives must be on the exact scale required for the stereo prints. But what, photographically, is the *width* of this cube when it is placed somewhat diagonally to the camera, as it should be? And, since its nearer points and its farther points are at different distances, what is to be taken as the working distance? And how is it to be known, by inspection of the focussing screen, whether the negatives will be on the proper scale? These questions really form the crux of the photographer's task, which becomes increasingly difficult when the object is not geometrical. The arrangement about to be described removes all uncertainty as regards width, distance, and scale, and, at the same time, clearly marks out on the negatives the exact boundaries along which the prints are to be trimmed before being mounted side by side. In its best form perhaps the apparatus consists of two vertical hanging cords, weighted at bottom and slidably suspended at top from a horizontal rod so that the distance between them can be exactly adjusted to correspond with a measurement which in every case is given by the working formulæ. Oscillations in the cords will be effectually damped out by allowing the weighted ends to dip into water, or, still better, into thick oil. Or two long straight knitting needles or lengths of Stubbs' wire may be fixed vertically into small feet or supports, so that each wire and its supporting base looks somewhat like a capital L. Two round-headed screws under the wire end of the base and one screw at the other end will allow the whole to be adjusted until the wires are perfectly vertical. They can then be readily moved about on any flat surface until the distance between the wires is that required by the formulæ.

H. C. Browne.

(To be continued.)

Finger-print Photographs by X-Rays.—The experts attached to the French police propose to employ X-rays to help in the taking of finger prints. "La Nature" gives some examples of the work, and says that instead of with ink, the finger tips will be coated with a salt, such as carbonate of bismuth, which makes a print on an X-ray negative similar to the old print on paper, so that when the negative is developed there will be a perfect picture of the whorls on the skin as well as of the bones and the outline of the finger nails. This amplification of the ordinary Bertillon method gives added means of identification, the shape of the nails and the bones being individually as different as the patterns formed by the whorls on the skin.

THE P.P.A. 1922 PROGRAMME.

THAT objection would be taken to the date fixed for this year's Congress was within the expectation of the Executive, and at a recent meeting of the Council it was decided to place on record, for publication, the reasons for the change from spring to autumn.

It has been growing evident year by year that the space kindly allotted to us at the Horticultural Hall was insufficient for our growing needs, and that unless larger premises were obtained the old and friendly partnership with the management of the Fair would have to be dissolved. When the offer of the usual accommodation came along, the whole question was anxiously and carefully considered from all points of view, and it was rightly decided that the space offered was insufficient, and with regret the decision was made to strike out, and find rooms for ourselves elsewhere.

For a change of policy, could any time be more appropriate than the coming of age? The year 1922 is the twenty-first anniversary of the formation of the P.P.A.—an association "doomed to extinction" (as was said a year afterwards), a prophesy in no sense fulfilled.

A sub-committee was immediately formed for the purpose of finding rooms, and a number of picture galleries were visited, but nothing suitable was procurable in the months of spring, and only two had vacancies in the autumn. Consequently the question was laid before the Council, and it was decided to fix upon those rooms obtainable at the latest time in the autumn. By good fortune these proved to be Prince's Galleries, Piccadilly, in every way the most convenient for our purpose, and available from September 11—13 inclusive. The rent for these splendid rooms will not be in excess of last year's cost of furnishing with screens, etc., the picture exhibition room at the Royal Horticultural Hall.

It will now be possible, and it is intended, to hold an international exhibition of professional work, and already some American leaders have notified their intention to exhibit.

The Congress itself will be run upon much the same lines as hitherto, except that the social side will have more attention paid to it than has been possible in the past, and new features of interest are to be introduced. There is plenty of space for demonstrations and lectures, and it is anticipated that not only our own countrymen but masters in the art from other lands will be invited to attend. Manufacturers will be accommodated with space for trade display.

That the date chosen will be inconvenient to seaside photographers was suggested, the "pros and cons" were thoroughly discussed, and, upon looking into the matter it was found that last year, with a paper membership of 1,300, only 30 came up from seaside towns, 7 from spas, viz., Bath, Tunbridge Wells, Harrogate, etc., and 230 from London and provincial towns.

It is fair to conjecture that with the alteration of date, the proportion of visitors from the coast will not be smaller, and that with the attraction of a coming of age celebration the comparatively small attendance will be increased, and the later date may even suit those from spas better still. It will be found that the usual photographic exhibitions open their doors somewhere about the date of our Congress.

Members will shortly be having in their hands a copy of the annual report, and they will see that the past year has been a busy and important one. The incorporation of the Society has necessarily thrown much extra work upon the Council, for many matters of vital importance in the interests of the Association had to be decided. It is well that this business is now completed, for registration is greatly to the advantage of the individual member; her or his liability is restricted to the small sum of 10s., the amount of the annual subscription.

It is perhaps well to remind members that this important step was approved at the annual general meeting held at the time of the 1921 Congress, and again confirmed at a special general meeting, to which all members were invited by circular. It is impracticable at present to supply members with a copy of the Articles, but they will be available at a later date

Now that this matter is accomplished, the P.P.A. Circular, or a magazine to take its place, will be re-established, and that broken link between Council and member repaired, much to the satisfaction of all concerned.

It now only remains to be said that the launch out from the old, and now inconvenient, arrangements at Vincent Square encourages the Council to look forward with confidence to the whole-hearted support of the members, in the belief that they will do their share towards making this coming celebration a record success, a Congress worthy of the Association and an event that all interested will be proud of.

On behalf of the Council.

LANG SIMS, Secretary

Exhibitions.

CAMERA PORTRAITS, BY WALTER STONEMAN, F.R.P.S.

THIS is one of the most interesting occasional exhibitions that the Royal Photographic Society has given the professional man for many months. If to be able to show a distinguished clientele of stars is an augury of prosperity in business, then Mr. Walter Stoneman should feel content, for he displays a perfect milky way of Men of Mark. He evidently has the grand secret. The galaxy ranges from royalty itself to the trade-magnate. Out of 81 portraits only five are plain esquires; all the rest have handles to their names. There are "noble dukes and belted earls," soldiers, sailors, apothecaries, in uniform; but for the tinker, tailor and ploughboy Mr. Stoneman has no use; though he admits an occasional "pale young curate." Even one or two painters by reason of their knighthood have become eligible for inclusion in this dazzling array of wealth and honour, of which the flavour is more of Debrett than of "Who's Who."

Mr. Stoneman believes in standardisation. His prints are all more or less of the same area that accommodates liberally a life-sized head; and the effect, upon first coming into the room, is not a little imposing—such a mighty row of bright heads on black backgrounds! One immense enlargement, and a few smaller prints in groups, break the monotony of this well-groomed, highly respectable company.

There is a good deal to be said for this standardising—for its effect in an exhibition, at least. A client can rely upon getting what he sees in the window. It is a special commodity: a head and bust about life size, with a straightforward lighting that makes silvery hair and spotless collars gleam out from the dark backing. The contrast undoubtedly makes for force, and that can be counted upon for captivating all classes.

Side by side with the "tities and orders" and the smartness of appearance, there is the no less popular attraction of smooth texture. Shadows melt into lights with a sweetness of gradation that never fails with the great B.P. In some cases, however, there is evidence that the retoucher has been spared, for a clear demarcation of sculptors' "planes" has been allowed to assert itself. This is noticeable particularly in No. 51, Sir Adolphus Ward, Litt.D., and The Lord Pentland, G.C.S.I. (52). These have a scheme of light and shade that is significant, and a human skin-texture rather than an egg-shell gloss. Others that stand out as examples, either of animated posing or of lively expression and character, are the Rt. Hon. D. Lloyd George, O.M., M.P.—the Premier at his best, without the cinema smile—The Lord Ribblesdale (9) in a silk hat (he was painted by Sargent in a silk hat), Field-Marshal the Viscount Allenby, G.C.B. (10), who has a martial bearing in spite of mufti, and Sir D. Murray, R.A. (15), which has both character and effective light and shade.

The Hon. Sir C. A. Parsons, K.C.B. (17), has a countenance that lends itself to good pictorial results. His portrait appears in two versions, one of which is in the illustrated catalogue; and this, to our minds, has the better turn of the head. One of the most interesting character studies is the portrait of the Bishop of Winchester (29). It is entirely free from that episcopal self respect that usually appears in the pictures of Bishops. Another very happy likeness, and one of the best achievements, is the thoroughly spontaneous Bernard Shaw, Esq. (32). With less of bravado, but quite as much convincing character is Sir J. J. Thomson, O.M., F.R.S. It is one of those examples in which the edges of the planes of modelling have not been beautified away.

In a few cases the assumed life-size has come out in the enlargement as a little under life-size; and this, we think, is a misfortune from more than one point of view. It certainly robs the subject of that monumental nobility and dignity which portraits like these should possess before all things. And in a gallery where a lot are shown together it is disconcerting to glance from one to the other and find the scale changing from large to small. Nos. 62, 63 and 64 is a group where the centre picture is possibly larger than life, whilst those that flank it are dwarfish; not small enough to be safe from comparison with the full scale.

The most pictorial portrait of all is that of Gen. Sir R. Baden-Powell, K.C.V.O (60). The General is rightly wearing his Boy Scout hat, which receives the full flood of a top light. Since Baden Powell equals Boy Scout in ordinary association of ideas, this prominence of the hat supplies an appropriate idea. The face beneath is in shadow for more than half its length; yet the whole effect is good and artistic. F. C. TILNEY.

FORTHCOMING EXHIBITIONS.

January 11 to 27.—Camera Portraits, entitled "Men of Mark," by Walter Stoneman, at the house of the Royal Photographic Society, 35, Russell Square, London, W.C.1.

January 21 to February 4.—Partick Camera Club. Particulars from the Hon. Secretary, James Whyte, 51a, Peel Street, Partick, Glasgow.

February 7 to 11.—Sheffield Photographic Society. Latest date for entries, January 21. Particulars from the Hon. Secretary, James R. Wigfull, 14, Parade Chambers, Sheffield.

February 11 to 25.—Scottish Photographic Salon. Latest dates, entry forms, January 23, exhibits, January 31. Particulars from the Secretary, James F. Smellie, Braefindon, Allanshaw Street, Hamilton.

February 14 to 17.—Exeter Camera Club. Latest date for entries, January 30. Particulars from C. Beauchamp Hall, Hon. Exhibition Secretary, Exeter Camera Club, "St. Denys," Bellevue Road, Exmouth.

February 18 to March 4.—Edinburgh Photographic Society. Latest dates, entry forms, February 4; exhibits, February 9. Particulars from the Hon. Secretary, G. Massie, 10, Hart Street, Edinburgh.

March 1 to 6.—Birmingham Photographic Society. Latest dates: Entry forms, February 8; exhibits, February 22. Particulars from the Hon. Secretary, P. Docker, Medical Institute Buildings, Edmund Street, Birmingham.

March 4 to 25.—South London Photographic Society. Particulars from the Hon. Secretary, Harry Abbott, 61, Beauval Road, East Dulwich, London, S.E.22.

March 8 to 9.—Birkenhead Photographic Association. Latest date for entries, February 25. Particulars from the Exhibition Secretaries, Messrs. Longstaff and Trace, 33, Hamilton Square, Birkenhead.

March 14 to 16.—City of London and Cripplegate Photographic Society. Latest date for entries, March 6. Particulars from the Hon. Secretary, J. J. Butler, 7, Gresham Street, London, E.C.2.

March 15 to 26.—Welsh Salon of Photography. Latest date for entries, March 9. Particulars from the Secretary, H. G. Daniel, 154, Penylan Road, Cardiff.

March 28 to April 1.—Hackney Photographic Society. Hon. Secretary, Walter Selfe, 24, Pembury Road, Clapton, London, E.5.

April 5 to 8.—Leicester and Leicestershire Photographic Society. Latest date for entries, March 22. Particulars from the Hon. Secretary, W. Bailey, Cank Street, Leicester.

May 1 to 6.—Photographic Fair. Horticultural Hall, Westminster. Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1

September 18 to October 28. Royal Photographic Society. Latest date for entries by carrier, August 25. Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, January 3 to 7.

PRINT CLIPS.—No. 538. Clips for suspending photographic prints, etc. A. C. Andrews.

SENSITISING.—No. 294. Sensitising film and paper. F. W. Hochstetter.

EMULSION.—No. 289. Sensitive positive emulsion for photography and process of making the same. F. W. Hochstetter.

EMULSION MAKING.—No. 291. Sensitive emulsion and process of making the same. F. W. Hochstetter.

TRANSLUCENT MEDIUM.—No. 293. Manufacture of translucent medium for photography. F. W. Hochstetter.

TRANSLUCENT MEDIUM.—No. 290. Translucent medium for photography, and process of making the same. F. W. Hochstetter.

PRINTING MACHINES.—No. 484. Photographic printing machines. E. Sankey.

ALBUMS.—No. 12. Film or photograph album. B. M. and C. S. Grace-White

COLOUR PHOTOGRAPHY.—No. 42. Interchangeable focussing screen for colour photography. G. C. B. Saw.

PROJECTION MECHANISM.—No. 292. Mechanism for projection of light. F. W. Hochstetter.

PROJECTION METHOD.—No. 128. Method of producing visual depth in projected pictures. T. H. Marten.

COLOUR PROJECTION.—No. 392. Apparatus for producing photographs and projecting them in natural colours. L. Rottenburgh.

STEREOSCOPIC COLOUR CINEMATOGRAPHY.—No. 391. Apparatus for producing stereoscopic moving pictures in natural colours. L. Rottenburgh.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1s. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

DRY-MOUNTING PRESSES.—No. 172,470 (October 6, 1920). The press is made as usual with a base 1 having two pilars 2, 2 surrounded by helical springs 3, 3 which carry the heated press box or platen 4, this in turn being depressed by a plunger 5 fitting in the arm or cross girder 6, and operated by a cam 7 on the handle 8. The goods to be operated upon are placed between the base 1 and the heated press box or platen 4.

In such construction, should a greater number of sheets be inserted between the base 1 and the press head or box 4 than

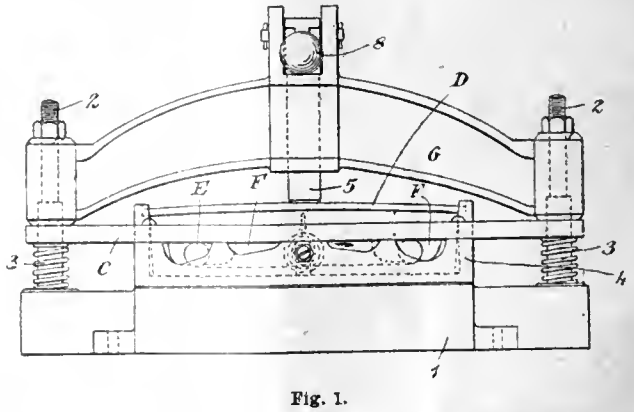


Fig. 1.

the proper working of the press will allow the operating handle 8 cannot be moved its full distance and any extra power put upon the handle 8 to move it its full distance will cause the plunger 5 to have such action upon the platen 4 that it invariably splits or breaks the latter rendering the machine useless until a new box is fitted to the machine.

The object of the invention is to so construct the heated platen that it is strengthened, and also to provide means whereby (even should more than the proper number of sheets be inserted) an extra pressure put upon the handle will not in any way injure the machine or split the heated platen.

For this purpose the heated box or platen 4 is constructed with webs A to strengthen it where most liable to be broken through excess pressure and on two extreme edges of the heated platen two vertical projections B, B are constructed, these projections passing through oblong slots which are made in the cover C of the heated platen 4 which is secured to the box 4 to receive the projections B, B.

Fitted between and resting on the projections B, B a plate spring D is fitted, or any other form of spring may be fitted, the

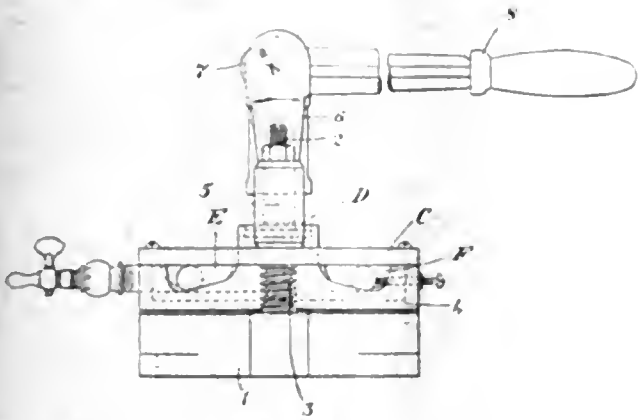


Fig. 2

centre of the spring D being placed immediately under the plunger 5.

The result of this is that the pressure when applied as the plunger 5 moves down instead of being in the middle of the heated platen 4 is distributed over the whole surface, and is therefore not so liable to crack the heated platen 4.

When in operation with the correct thickness of material in the press the plunger 5 acts on the spring D and moves it with the head comprising the box 4 or cover C to effect the desired pressure and without materially flexing the spring D. But should more than the proper quantity of sheets be inserted any extra pressure on the operating handle 8 will, after the press

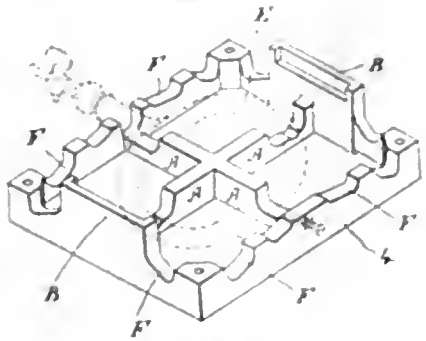


Fig. 3

head has effected its proper pressure, act upon and flex the spring D and so the handle 8 can be moved its full distance without injuring the machine or sheets under treatment, and the heated platen 4 will not be injured owing to the pressure being more evenly distributed and maintained.

The box head contains the gas burner E; as is usual the upper edges of the sides of the box 4 are formed with recesses F to allow of escape of the products of combustion.—Percival James Burrell, 569, High Road, Tottenham, London, N.17, and John Joyce, Imperial Works, White Hart Lane, Tottenham, London, N.17.

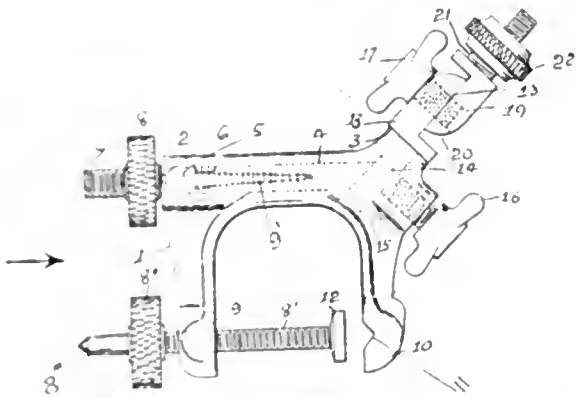
CAMERA SUPPORTS.—No. 172,775 (September 30, 1920). The invention is a frame of U-pattern to which a camera can be attached, whilst the frame is fixed to some support such as a tree or post.

1 is the frame formed approximately U shape and carries the projecting pieces 2 and 3. The limb 4 of the U is bored or otherwise hollowed out as indicated by dotted lines and screw-threaded at 5 to receive the screw-threaded part 6. Such part 6 consists of the screw-threaded portion 7 rigidly carrying at or about mid-length the grip piece 8 consisting of a disc preferably knurled or milled at its periphery, the portion 7 carrying at one end a screw-threaded part 9^1 which latter part is preferably formed taper and provided with screw threads of the wood variety.

The screw-threaded part 7 is adapted to engage with the screw threads 5 formed in the limb 4. 8^1 is a screw-threaded shaft which has free screwing movement in the U limb 9 in order that when such shaft is rotated in one direction it recedes from the U limb 10 which is preferably furnished with the recess 11, this recess being provided for receiving round or irregularly shaped articles, such as walking sticks, to which apparatus for the time being is clamped, and when rotated in the other direction moves towards the limb 10.

The shaft 8^1 is furnished with the means for its rotation, preferably consisting of the milled disc 8^{11} rigidly secured to the shaft 8^1, and also with the disc 12 rotatably secured thereto.

The frame may be secured to any suitable support by squeezing the support between the recessed portion of the limb 10 and the disc 12 by the rotation of the shaft 8^1, or it may be secured to a support such as the trunk of a tree, by screwing the part 9^1 into such support. In this latter case the part 6 is removed from the position it occupies, as shown in fig. 1, and being reversed the part 7 is screwed into the threaded part at 5, with the result that the part 9^1 projects from the frame, thus enabling the part 9^1 to be screwed into the support, and at the same time shaft 8^1 is rotated in the direction which causes part 12 to recede from the



recessed portion 11 of limb 10 until the extended taper portion 8^{111} reaches the tree trunk or any support the screw 9^1 happens at the time to be attached to in order to give the apparatus more stability.

13 is a part formed as shown with a spigot 14, such spigot having free movement in the boring 15 in which it is held in the desired position by the set screw 16. Hinged to the part 13 by means of the set screw 17 passing through the plain perforation 18 in the part 13 is the swinging part 20, the set screw 17 screwing into the screw-threaded perforation 19 in the part 20, thus holding the parts 13 and 20 together in any desired position.

The part 20, as will be seen, rigidly carries the part 21, formed with two diameters both of which are screw-threaded, the larger diameter carrying the nut 22 to operate as a lock nut to the object supported, which is secured to the smaller diameter of the part 21.—Edward George Pyne, 26, Queen's Road, Beckenham, Kent, and The Monarch Engineering Company, Ltd., 141, Sydenham Road, Sydenham, S.E.26.

The following complete specifications are open to public inspection before acceptance:

PROJECTION APPARATUS.—No. 173,497. Method of and apparatus for producing pictures by projection. H. A. Smith and E. J. Marston.

COLOUR REPRODUCTION.—No. 173,509. Method and apparatus for reproducing in colour paintings, drawings, or prints and the like. G. Piccioni.

Trade Names and Marks.

MARKS PLACED ON THE REGISTER.

The following marks have been placed on the register:—

NOVEX.—No. 418,671. Chemical substances used in photography, photographic plates, and photographic films. Kosmos Photographics, Ltd., Balfour House, Finsbury Pavement, London E.C.2, and Pixmore Avenue, Letchworth, Hertfordshire, manufacturers.

New Materials.

Vittex Rapid Gaslight Paper. Made by Gevaert, Ltd., 115, Walmer Road, North Kensington, London, W.10.

MESSRS. GEVAERT have added to their numerous development papers one which yields rich warm black tones directly in the developer. This new paper, Vittex, is intermediate in speed between bromide and gaslight, that is to say, it is several times as fast as the average gaslight paper, and is thus of a speed which is convenient for commercial work without the necessity of very special equipment as regards power of light in the printing box. An idea of its sensitiveness is given by stating that the exposure required by an average negative, 12 inches from a 50-c.p. lamp, is about 10 seconds. While, of course, there is no insuperable difficulty in increasing the light in a printing machine in correspondence with the slowness of a printing paper, the convenience of the considerable speed of Vittex will be appreciated by those wishing to use a paper of this kind with the least possible disturbance of the ordinary working conditions.

Any ordinary developer may be used, but the makers recommend one or other of the following:—

For Soft Negatives.

Metol	13 grs.
Soda sulphite, cryst.	1 oz.
Hydroquinone	50 grs.
Potass. carbonate, cryst.	2 ozs.
Potass. bromide	8 grs.
Water	20 ozs.

For Strong Negatives.

Metol	25 grs.
Soda sulphite, cryst.	¾ oz.
Hydroquinone	8 grs.
Potass. carbonate, cryst.	1 oz.
Potass. bromide	8 grs.
Water	20 ozs.

A fairly strong negative appears to be the best for Vittex, but by using the first developing formula prints of quite satisfactory vigour are obtained from negatives which would be regarded as distinctly soft for a normal printing paper. The user can, if he likes, mix the two developers together in any proportion for the purpose of making prints of just the degree of vigour which he fancies.

Vittex prints come up quickly in the developer, and development is complete in from 40 to 60 seconds. The time of development is perhaps the only item in the handling of the paper to which it is necessary to give particular attention in order to get the best results. Prints should be exposed so that they are not too dark after 40 seconds' development, nor too light after remaining for a minute in the developer. The user must not expect to force an under-exposed print in development, or snatch out one which has been over-exposed, and at the same time obtain the fine colour and gradation yielded by the paper under proper treatment. Fixing is done in an acid bath consisting of hypo and metabisulphite.

The colour given by the paper is a rich warm black with rather more brown shade in it than some other papers of this type which we have used. Its characteristic colour quality shows to the best advantage in the cream varieties, sold as "Chamois," the results on which are of a specially artistic character. As regards the gradation, the prints show exceedingly good rendering in both the light tones and the deep shadows, and complete purity of the high lights. The makers have evidently made good use of their long experience in the manufacture of emulsion papers in uniting the qualities of their earlier grades with the production of a warm black colour.

The Vittex paper is issued in no less than twelve different varieties, six white and six cream. These represent glossy, semi-glossy, matt and fine grain surfaces and include also card weights. The photographer must be difficult to please who cannot find among these grades one which answers his special requirements. The "Chamois" matt smooth (No. 7) and "Chamois" fine grain (No. 10) appear to us as two of the grades particularly to be recommended for studio portraiture, but the other grades, both "Chamois" and white, have distinctive fine qualities. We are quite sure that professional photographers will be anxious to make the acquaintance of this notable addition to the Gevaert papers.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, JANUARY 23.

Bradford P.S. "Elementary Bromide Enlarging." Wellington and Ward.
City of London and Cripplegate P.S. "The Printing of Bromide Papers." N. F. Horne.
Dewsbury P.S. Y.P.U. Portfolio.
Kidderminster P.S. "Odds and Ends." Dr. Landon.
Leeds Camera Club. Demonstration Competition.
Southampton C.C. "From the Cape to Zambesi." B. J. Simester.
South London P.S. "Personal Practice in Lantern Slide-making." H. Pickwell.
Wallasey A.P.S. "Fosses and Fjords of Norway." J. Mansell.
Walthamstow and Dist. P.S. "Gaslight and Bromide Contact Printing." E. Willcocks.
Birmingham Phot. Art Club. "Lenses, their Uses and Abuses." W. T. Comer.

TUESDAY, JANUARY 24.

R.P.S. "The Plate and the Photographer." C. M. Thomas.
Birmingham Phot. Soc. R.P.S. 1920 Competition Slides.
Dennistoun Amateur P.A. Whist Drive.
Exeter Camera Club. "Carbon Printing." F. G. Tutton.
Leeds P.S. "The Romantic in Landscape." F. C. Tilney.
Morley P.S. "Wharfedale." Mr. Nevin.
South Shields P.S. "Bromoil in Monochrome and Colours." H. S. Becke.
Tyneside P.S. "Panchromatic Photography." B. Redford.
Welfare C.C. Scottish Photographic Federation Portfolio.
Hackney P.S. "Composition." R. H. Lawton.
Birmingham Phot. Soc. R.P.S. 1920 Competition Slides.
Nelson P.S. "The Farne Islands and Bird Life." G. A. Booth.
Stalybridge P.S. Lecture. J. G. Kitchen, of Messrs. Thornton, Pickard, Ltd

WEDNESDAY, JANUARY 25.

Borough Polytechnic P.S. Third Lantern Slide Competition.
Croydon C.C. "Making Lantern Slides and Transparencies." H. P. C. Harpur.
Dennistoun A.P.A. "Criticism of Members' Prints." Dan Dunlop.
Forest Hill P.S "Toning." J. H. Sinclair.
Ilford P.S. "Outing Reminiscences." H. Flower.
Partick C.C. "Holidays in a Forfarshire Glen." J. D. Ross.
Photo-micrographic Soc. Members' Evening.
Rochdale Amateur P.S. "A Night with J. C. Wild."
South Suburban P.S. A.P. and P. Prize 1921 Slides.
Birkenhead P.A. "Children of the Camera." T. H. Greenall.
Catford C.C. "Along the Cote d'Emerande." W. Haines.

THURSDAY, JANUARY 26.

Camera Club. "Palestine from the Air." H. Hamshaw Thomas.
Gateshead C.C. "Panchromatic Photography." Burdess Redford.
Nelson P.S. "How a Reflex Camera is Made." W. Butcher and Sons, Ltd.

FRIDAY, JANUARY 27.

Wombwell P.S. "With Allenby through Palestine with a Watch-pocket Carbine." Butcher and Sons.

SATURDAY, JANUARY 28.

South Suburban P.S. Annual Affiliation Dinner.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, January 17, Mr. E. W. Mellor in the chair.

A paper, entitled "Automatic Methods of Cinematograph Film Development and Fixing," was read by Mr. H. V. Lawley.

The author referred to the primitive methods still largely in use for the mechanical handling, in development, fixing and washing, of the very great lengths of film which were required in the trade circulation of a long drama film. One such film measured nearly a mile, and thirty duplicates were commonly issued to the theatres. Among the many inherent disadvantages of the system of development of short lengths on frames, was the continual variation in the strength of the developer. Mr. Lawley had designed, made, and had in regular working for over two-and-a-half years, a plant in which film is continuously developed, fixed, dyed, washed, and dried. Unlike others, it allowed of the period of development being adjusted without curtailing the length of treatment at other stages of the process. The plant consisted of a series of 2½-inch vertical tubes, most of them 26 ft. in length, through which the film passed, in festoons down and up each in succession.

The first two contained developer continuously supplied by drip feed from overhead tanks. On emergence from the first tube, after two minutes, the film could be given longer development, length by length, as seen to be necessary.

Owing to the very slight pull on the film, breakages of joins scarcely ever occured, and wastage of film was reduced to an insignificant fraction of 1 per cent. The floor space required for the whole plant was less than for the drying drums on the ordinary system, and a staff of three was sufficient for the management of three machines, each treating 1,500 ft. per hour.

Another feature of the system was the beautifully clean and polished condition of the film obtained by a species of vacuum cleaning before washing.

Mr. Lawley showed drawings of the plant and answered some questions; and on the proposition of the chairman, a most hearty vote of thanks was accorded to him.

CROYDON CAMERA CLUB.

Messrs. Vivian Jobling and E. A. Salt gave a joint lecture-demonstration on "Some Factors Concerning the Rapidity of a Lens," intended primarily for beginners. The system of marking stops was explained, and other factors dealing with rapidity, apart from aperture, were dealt with in simple language. A practical contrivance for directly reading the effective aperture was shown, and the lecture concluded with an exposition of a modification of Clay's pinhole and mirror method of measuring focal length. The model operated proved to be convenient and accurate in use. In the absence of drawings a reference to these devices, and the paper read, must be deferred.

In the discussion, Mr. Tayler narrated the experience of a friend, who complained to an assistant at a photographic dealers that the top speed, marked "1/1,000" of a focal-plane shutter purchased there, had on test showed a maximum speed of only 1/400th second, which was not fast enough for the work in hand. "Well if 1/400th of a second is not fast enough for you, the obvious remedy is to stop the lens down," suggested the assistant, whose ideas on the subject seemed a trifle mixed.

Referring to rapidity apart from aperture, Mr. Tayler said he had been the possessor of three f/4.5 anastigmats of recognised make, and had found one lens to be appreciably faster than the two others. He had also an enlarging lantern fitted with a rapid portrait objective. In practice this required stopping down to f/8 to obtain sufficient covering power, and then colour bands formed impossible to eliminate. He inquired why enlarging lanterns were so often supplied with these lenses. "Undoubtedly because they are the very worst for the purpose," volunteered Mr. Hibbert. For much the same reason all modern anastigmats were made without lens-hoods, because they most needed them, he added.

Mr. Harpur said he aspired to knowing nothing about optics, and much about lens-hoods. If really efficient ones were fitted there would be trouble when a thoughtless operator employed the rising front.

Working with a Goerz "Dagor," Mr. Walker had experienced more general fog on the plate when using a lens-hood than without one. It was, he said, inexplicable how some unhooded lenses with a very large circle of illumination induced but little general fog, whilst with others the reverse was the case.

Mr. Catharine said he had watched the action of his lenses very carefully, but had never seen them behaving in any way resembling the remarkable performances illustrated on the blackboard that evening. He had often been struck with the clear cut shadows and quality in the pictures taken with a single combination of the Zeiss "Protar."

Mr. Budd said he had been much interested in the recent articles in the "B.J" on the rapidity of lenses. Starting in the simplest possible way Mr. Geo. E. Brown gradually led the unsuspecting general reader into complex ground he would never dream of entering of his own free will. The simple explanation of the "H. and D. Doctrine" by the same author was another case in point. To understand the latter portion, he (Mr. Budd) had been compelled to study the original papers of Messrs. Hurter and Driffield. [An excellent result.—Eds., "B.J."]

On the proposition of the chairman, Mr. F. C. Reynolds, a hearty vote of thanks was accorded the lecturers.

EDINBURGH SOCIETY OF PROFESSIONAL PHOTOGRAPHERS.

Meeting held Monday, January 9. Present:—Messrs. J. Campbell Harper, George Balmain, Norman Thomson, E. D. Young, John Thomson, Laing, Fergusson, W. J. Hutcheson, W. B. Hislop, and A. Swan Watson. Mr. J. Campbell Harper, the president, in the chair.

The secretary read the report on the annual dinner, held on December 5, 1921, which was approved.

The meeting discussed the fixing of minimum prices for commercial photography. The secretary submitted the prices which were originally fixed and those which were afterwards substituted therefor, and also the proposed costing basis table, with a percentage of profit added, as proposed by Mr. Moffat. These prices were compared with those charged by similar associations, and were considered to be very reasonable. After considerable discussion, in which the views of the members were freely expressed and suggestions made, it was resolved to recommit the whole matter to the committee appointed at the meeting of March 7, 1921, of which Mr. Moffat was convener, for further consideration and report. Mr. Hislop was co-opted a member of the committee.

Messrs. James C. H. Balmain, A. Swan Watson, and J. Campbell Harper were appointed a committee to visit the classes at the College of Art, and also the class of Optics and Chemistry under the Edinburgh Education Authority, which classes are carried on under the able tuition of Mr. Drummond Young and Mr. W. B. Hislop, so that the interests of the Society in these classes might be maintained. The committee were requested to make any suggestions which, in their opinion, would improve the methods of tuition or otherwise in the carrying on of the classes. The secretary was directed to write to the Secretary of the College of Art, and also the Edinburgh Education Authority, informing them of the appointment of this committee, and to say that they hoped to visit the classes in the course of next month.

Arising out of Mr Robert Scott's suggestion that the time was most opportune for the formation of a northern federation to embrace the provincial towns, Mr. Young proposed that the Society should carefully and seriously consider the advisability of altering their constitution so as to admit of photographers from Aberdeen to Newcastle. It was felt that if there was such a federation, a Congress could be held in Edinburgh which would have the most beneficial effect on professional photographers, as so many of them are unable to attend the Congress of the Professional Photographers' Association in London. It was, however, pointed out that the constitution of the Society could only be altered at an annual general meeting, and the matter was in the meantime left with the members

to turn over in their own minds the best course which should be pursued.

It was agreed to hold an informal meeting of the Society at the Victory Café on Monday, January 23, at 8 p.m.

Commercial & Legal Intelligence.

NEW COMPANIES.

BOOTH GRIFFIN PHOTOGRAPHIC SERVICE LTD.—This private company was registered on January 2, with a capital of £1,500 in £1 shares (1,200 participating preferred and 300 ordinary). Objects: To carry on the business of photographers (commercial and trade), photographic and portraitive artists, advertising contractors, dealers in works of art, etc. The first directors are: H. Wm. S. Booth, Penn Manor, Wolverhampton; P. A. Court, 346, Soho Road, Handsworth, Birmingham. Qualification: 50 shares. Remuneration as fixed by the company. Registered office: 346, Soho Road, Handsworth, Birmingham

News and Notes.

DEATH OF MR. W. H. SIMMONS.—We regret to announce the death of Mr. W. H. Simmons, late of Kosmos, Ltd., Letchworth, Herts., on January 17, 1922, after a very serious operation.

LARES-MASTER PROJECTION PRINTER.—A descriptive circular of this vertical apparatus for printing, copying and enlarging reaches us from the Atlantic Photo Supply Co., 319N, Howard Street, Baltimore, U.S.A., by whom it is supplied, without lamp or lens, at 407.50 dollars.

OFFICIAL PRESS PHOTOGRAPHS IN FRANCE.—The Press Bureau of the French Foreign Office is now placing its photographs of events all over France at the disposal of journalists for the illustration of articles. These facilities are generously extended to English and American correspondents.

EASTMAN PORTRAIT FILM.—Messrs. Kodak, Ltd., have just published a 60-page booklet containing appreciations and expressions of experience of Eastman portrait film by about 120 professional photographers, among whom are leaders in the West-End of London and proprietors of studios of very various grades in different parts of the country.

A NEW AUTOMATIC CAMERA.—Among the novelties at Selfridge's Industrial Exhibition last week was a machine which takes a photograph and delivers it in three minutes in return for a coin. The camera can take 250 portraits without any re-charging of chemicals. No negative is used, there is no hand operation, and only occasional attention is needed to keep the machine in order.

CITY OF LONDON AND CRIPPLEGATE PHOTOGRAPHIC SOCIETY.—There will be an open class at the exhibition of this society to be held at the Cripplegate Institute, from March 14 to 16. The exhibition will be opened by the Lord Mayor of London, at 3 p.m., on March 14. Entry forms for the open class are obtainable on application to Mr. J. J. Butler, 7, Gresham Street, E.C.2. The latest date for the receipt of entries is March 6.

STOCKTAKING BARGAINS.—Messrs. Wallace Heaton, Ltd., 85, High Street, Sheffield, have just issued a 60-page list of cameras, lenses and photographic accessories, which they are including in a New Year stocktaking clearance sale, at specially attractive prices. Vest-pocket and other folding cameras are a prominent feature of the list, which includes reflex, folding focal plane and studio cameras, as well as lenses of many different types and makes. Goods are offered on a seven days' free trial.

INCOME TAXPAYERS' SOCIETY.—Everyone who has to pay income tax and has had any experience of some of the methods, or, perhaps, one should say want of method, of Inland Revenue officials, will applaud the formation of this society under the presidency of Lord Inchcape. The Society has been established for the protection of the interests of the 2,450,000 people who now contribute the nation's most prolific source of revenue, amounting, with super-tax, to approximately £400,000,000. The Society provides payers of income tax with a strong central organisation qualified to give disinterested advice, and affords them an opportunity of being heard effectively. The Society will take legal action in test cases of importance, and, as we see in the Press at the time of writing, is about to contest the legality of assessing super-tax on the gross income, that is to say, before deduction of income tax. In the present circumstances, when the excessive drains of taxation are pressing both individuals and companies most injuriously, and are promoting trade depression and unemployment, the influence of a large and powerful association of this class of the community can be most beneficial. The subscription to the Society has been fixed at the purely nominal sum of 5s. for individuals; £1 1s. for corporations and firms. Inquiries and communications should be addressed to the Secretary, Income Taxpayers' Society, Iddesleigh House, Caxton Street, London, S.W.1.

STAFF DANCE.—The staff and a few friends of the Manchester branch of Mr. N. S. Kay, photographer, held a most enjoyable dance at the Deansgate Arcade Café on Saturday last. All the cares and troubles of the reception room, printing room and finishing

room were put aside, and everyone came with the determination to enjoy themselves to the utmost. Dancing, music, a card party and last, but not least, a well-served supper brought a most enjoyable evening to a close as the clock chimed eleven.

£3,000 ALL-BRITISH COMPETITION.—The announcement is made on another page of this issue of an all-British competition for amateur photographers in which £3,000 will be awarded in prizes. The competition is promoted by the following firms: W. Butcher & Sons, Ltd., Elliott & Sons, Ltd., J. J. Griffin & Sons, Ltd., Houghtons, Ltd., Ilford, Ltd., T. Illingworth & Co., Ltd., Imperial Dry Plate Co., Ltd., Kosmos Photographics, Ltd., Leto Photo Materials, Ltd., and Wellington & Ward. The prizes are awarded for photographs taken with one or other of the following makes of camera: Cameo, Carbine, Ensign, Klimax, Klito, Mascot, Midg, Pressman and Sanderson. Negatives are to be taken on Barnet, Griffin, Ilford, Illingworth, Imperial, Leto, Novex or Wellington plates. The printing papers to be used for the prints or enlargements are: Barnet, Griffin, Ilford, Illingworth, Imperial, Kosmos, Seltona or Wellington. The competition will be held in two parts, one closing on June 30 and the second on November 30. As will be seen from the prospectus and entry form, obtainable from photographic dealers, the organisers have subdivided each competition into seven classes, so arranged that the users of cameras both large and small and also those whose experience in photography is of the smallest will have favourable opportunities of winning a prize. All communications relating to the competition should be addressed to the office, at 4, Oxford Street, London, W.1, of the committee of management.

A NEWSPAPER PRINTED BY A PHOTO-OFFSET PROCESS.—The issue of the "Blackpool Times" for January 6, 1922, marks a new stage in newspaper production. The complete paper, both type and illustrations, has been printed on a rotary offset machine, and the plates prepared by a photo-lithographic process. The type pages

have been set and made up in the usual way, photographed by the wet collodion process, and then printed direct on to the zinc or aluminium plates for the machines. The illustrations are done by a high-light half-tone process. The type matter is remarkably clear and sharp, and the solids possess a strength which is never seen, and, in fact, cannot be obtained by ordinary rotary newspaper methods. The excellence of the result is more remarkable because ordinary newsprint has been used. The illustrations are interesting, since ordinary news photographs, including some taken by flashlight, have been used to produce results which are better than any newspaper prints we have seen, excepting a few in machine gravure, which are always printed on a much superior paper. The "Blackpool Times" is a bi-weekly paper of twelve and sometimes sixteen pages, and the photo-offset results since the first issue show an even better quality than the first one. The printers, Messrs. J. Robertson & Co., Ltd., of St. Annes-on-the-Sea, are to be congratulated on the enterprise shown in attaining success in this new field of newspaper production. We do not anticipate that the methods employed would be suitable for a big daily paper, in the present state of development, but it is evident that the new process has great possibilities.

Correspondence.

*** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** We do not undertake responsibility for the opinions expressed by our correspondents.*

THE PERSULPHATE REDUCER.

To the Editors.

Gentlemen,—In your issue of December 9, p. 726, referring to a recent paper on persulphate reduction by the writer, you state—"A year or two ago ("B.J.," July 12, 1918, pp. 314-315) Dr Sheppard, in a short paper, ascribed the *activity* of the persulphate reducer to the presence of minute traces of iron salts." This statement is not quite correct. My original statement was "B.J.," loc. cit. p. 314): "The small amount of iron salt present as an impurity in ammonium persulphate is thus the cause of its *variability*, and iron, however introduced, is a powerful catalyser of the action of persulphate on metallic silver." The recent investigations show that this should be qualified by reference to the acidity. It happens that most commercial samples which have come under the writer's observations have been but slightly acid, and their initial activity has varied according to the iron content. The levelling effect of relatively large amounts of acid appears to be due less to any counter-balancing of the action of impurities than to its direct part in the reaction, by dissolving oxide films.

As you state, the practical conclusion from this last investigation is that the reducer should be acidified with sulphuric acid to about ½ per cent.; the conclusions on the theory of the process, however, are somewhat contrary to your last pronouncement on that subject ("B.J.," March 11, 1921, p. 135), since no evidence for a "characteristic depth reduction" was obtained.—Yours faithfully,

S. E. Sheppard.

Eastman Kodak Co., Rochester, N.Y. December 28, 1921

THE P.P.A. CONGRESS.

To the Editors.

Gentlemen,—The suggested alteration of the date for holding the above is essentially a matter for discussion.

Before coming to a decision the Council should have ascertained the views and wishes of the members, and, if not too late, I hope they will take this suggestion in the spirit in which it is offered, and, if possible, act upon it.

A postcard referendum would be a simple, effective and inexpensive means of knowing how far the Council is supported in moving forward to September the annual congress and reunion. A reply-paid postcard or circular should be sent to every member, asking them to approve one of these dates, viz.: Do you approve of the conference still being held in April? Signature.

2. Or in September, as the Council suggest? Signature.

Provincial and country members do not get many opportunities of contact with the Council, so before coming to a decision in a matter so vitally important to the interests of the Association the executive ought to know the mind of the members and how far this new move is likely to be supported.

Personally, I favour the old date, with the added interest and attraction of the Photographic Fair.

I feel sure that April is the month when provincial and seaside members can be spared from their businesses much more easily and in larger numbers than in September!

In a matter of this kind affecting us all the *majority vote should decide*, and "the ayes have it!"—Faithfully yours,

S. H. Greenway.

27, Abingdon Street, Northampton. January 16.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

W. H.—The F No. of a telephoto lens is measured in the same manner as that of a positive lens, namely, by dividing the actual equivalent focal length by the effective diameter of the largest stop. The effective diameter is obtained by the well-known pinhole method in the same way as that of a positive lens.

W. A.—(1) A half-plate or whole-plate camera of square or broad taper pattern with R.R. lens of 7 or 8 inches respectively. (2) Exactly, so far as perspective is concerned it makes no difference what the focal length of the lens is. The focal length simply determines the scale on which the photograph is produced as seen from a given standpoint.

A. B.—(1) You can obtain gelatine sheets of various thicknesses from Messrs. Penrose & Co., 109, Farringdon Road, London, E.C.1. (2) Exposure is not materially affected. (3) As a rule a dark distemper background kept more or less in shadow, is used, but a dark green or brown serge will answer very well. It is very difficult to get a clear glass background in the negative; even black velvet will not give this unless well shaded.

L. G. B.—We think it would be quite practicable to close up the bottom of the sewer pipe with concrete, that is a mixture of about half and half fine sand and Portland cement. The paraffin is melted paraffin wax obtainable from any drysalter. Probus paint is a waterproof and acid-proof paint on the market in America, but not here so far as we know. A substitute suitable for the purpose is the anti-sulphuric paint sold by dealers in electrical requisites as an acid proof coating.

F. Richards.—We think the best thing you can do is first to clean the print by making some ordinary flour paste and brushing this over with a soft brush so as to brush away dust or dirt in the crevices of the paper. Then, after rinsing the paste off under the tap, soak the print in glycerine and squeegee to a glass plate and photograph through the glass. If the print is on a thin paper it would be well to apply a sheet of white paper behind it when photographing. We think if you do this you will get the least amount of grain showing in the copy. Exposure should be full so that detail begins to develop up readily.

R. B. W.—The reproduction appears to be made from an original which has been entirely worked up by hand. The effect could be got by giving a thin coat of white all over the subject by means of the spray apparatus and then working up with black where necessary. Or the dark parts may have been painted all over

with "Masklene," a preparation sold by the Aerograph Co., the white sprayed all over and the "Masklene" dissolved off. If you write to the Aerograph Co., 43, Holborn Viaduct, London, E.C.1, they will send you particulars. As a rule special artists are employed by the block makers to do this class of work.

T S. M.—The camera is not at all a suitable one for use from an aeroplane. It is rather inconvenient to handle and, dependent upon the amount of vibration of the machine, it is very doubtful if 1/90th of a second nominal speed of the shutter will be sufficient to obtain sharp negatives, even if focus is sharp. Most aerial photographs are taken with a focal-plane shutter, as much on account of the vibrations of the machine as on account of the movement of the image due to the movement of the aeroplane. Apart from one of the special aerial cameras, about the best for the purpose is the ordinary focal plane, such as is used by Press photographers.

G. C. R.—We cannot give you a formula for making a more transparent medium than those already on the market, none of which is in the slightest degree opaque. The fact that the medium is visible in enlarging is due to the fact that it refracts the direct rays of light slightly, but this can be overcome by placing a ground glass between the light and the condenser. It is a good plan to rub the medium *all over* the negative, then the edges will not show. In many districts the washing water deposits a fine film of lime all over the negative and the medium renders this transparent where it is applied. The remedy is to swab the negative thoroughly with a pad of cotton wool before placing it in the drying rack. Possibly you have been putting on the medium too thick; if so, ridges are often visible in the enlarged image.

R R.—The under-exposure of the flashlight exposure is evidently due partly to the small stop in the lens and partly to the use of a not sufficiently rapid plate. Perhaps also partly to the powder not being spread out into a long enough train. You should be able to get sufficient definition with *f*/16 stop or at the outside *f*/22. You should use one of the ultra-rapid Iso plates, such as the Marion "Iso Record" or the Barnet "Super Speed Iso." Also the powder should be spread out to a length of from 1 to 2 ft. at least. If the lamp is not long enough for this, a strip of sheet iron bent into shallow trough form will answer, the powder being fired by means of a small piece of guncotton placed about midway along the train of powder and ignited by a match held on a stick of 2 or 3 ft. in length. As regards focussing, the lights in the hall ought to be of sufficient power to allow satisfactory focus being obtained, particularly if you use a magnifier.

E. J. C.—(1) We suppose that the photographer named pays a certain sum for the sole right to take photographs of any description on the pier. He therefore is within his rights in preventing any person from using a camera on any part of the structure of the pier. (2) On the other hand, if a person manages to take any snapshots on or from the pier no action could be taken against him under copyright law, and we do not think that any action at all could be taken. (3) Rights in the foreshore of a seaside place are usually regarded as the property of the local authority, which therefore has the power to prevent anyone from taking photographs or offering photographic work on this place. Certainly the local authority would take this course if it has granted a licence to some one photographer for a given period (4) We do not think it would make any difference, as regards restriction of photographic work on the foreshore, whether another photographer had a business in the town and an order from his customer on the foreshore.

H. R.—The following is the best formula we know for oak stain for frames:—The materials are Vandyke brown crystals and washing soda. The former are not sold by every drysalter, though obtainable at the larger colour stores, but can be had from firms such as Messrs. Cashmore, Victoria Street, Bristol. The powder Vandyke brown is not suitable, as it clogs the grain of the wood and destroys the pattern. To make the stain, mix 2 to 3 ozs. of Vandyke brown crystals with a handful of washing soda. Place in a saucepan, with half gallon of water, bring to the boil and continue boiling until thoroughly dissolved. The mixture is then bottled for use. It can be mixed with further water according to the depth of colour required. If applied hot it sinks more deeply into the wood, though it is quite efficient when used cold. The stain should be well rubbed into the wood with a short bristle brush. If desired, the stained frame, when dry, can be well rubbed over with a little linseed oil, which gives a semi-polish and imparts a lustre to the colour.

H. P.—For heavy pyro stain the most effective remover is the bleach of permanganate, salt and acetic acid, introduced some years ago by the Ilford Co., followed by re-development. We give instructions from an article in a past "Almanac":—

Potassium permanganate	50 grs.	517 gms.
Common salt	¼ oz.	12.5 gms.
Acetic acid (glacial)	1 oz.	50 gms.
Water	20 ozs.	1,000 c.c.s.

If the negative is one freshly made, it is as well to pass it through a weak bath of chrome alum (about 50 grs. in 10 ozs. of water, *i.e.*, 10 gms. per litre) before applying the bleacher. The latter is allowed to act for 10 minutes, rocking all the time. It cannot harm the gradations of the negative, and this full time makes sure of the removal of the stain, and avoids a repetition of the process. After a brief rinse the negative is left in a solution of potass metabisulphite (1 oz. in 20 ozs. of water) until white everywhere to the back of the film, and is then re-developed in any non-staining developer. This formula will remove the heaviest stain. In less obstinate cases stain can be removed by soaking the negative in hypochlorite solution, very conveniently 1 oz. of the "Milton" sold by chemists mixed with, say, 10 ozs. of water, or less if necessary.

G. G. (Winnipeg).—The following are particulars of the Playertype process. You will see that it depends on the difference in the reflecting power of paper caused by the presence on parts thereof of any black impression, a photographic silver image or an ink impression. The engraving (line drawing) to be copied is laid face downwards upon a perfectly flat surface, the sensitive (bromide) paper is laid film side downwards upon it, and a sheet of glass placed over all. A yellowish light is then held over the glass, the exposure being made through the glass and the sensitive paper. From three to ten minutes may be necessary in yellow light, according to the sensitiveness of the paper; with white light the exposure is much shorter. The developer recommended for this work is:—

Hydroquinone	30 grs.	7 gms.
Sodium sulphite	120 ,,	28 ,,
Sodium carbonate	240 ,,	56 ,,
Water	10 ozs.	1,000 c.c.s.

Development is continued until the image appears to be buried. Having obtained a negative in this way, prints may be obtained from it by contact printing. The method has the advantage of giving a direct copy (a paper negative) of the same size as the original, and, of course, without using a camera. The clearer and more contrasty the original drawing or engraving, the better will be the copy on the bromide paper, but should the latter be faulty, it may be intensified, reduced, or cleared. The process was modified somewhat in 1900, when a sheet of green glass was laid over the paper, and the exposure, of from five to ten minutes, made through that. The process has recently been revived in a somewhat different form as the "Manul" process, recently patented in Germany by Ullmann.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. PRICE FOURPENCE.

TERMS OF SUBSCRIPTION POST FREE.

UNITED KINGDOM OR CANADA.—*One Year*, £1 1s. 8d.; *Six Months*, 10s. 10d.; *Three Months*, 5s. 5d.

ANY OTHER PART OF THE WORLD.

One Year	£1 3s. 10d.
Six Months ...	12s. 0d.
Three Months	6s. 0d.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibits the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

HENRY GREENWOOD & Co., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3221. Vol. LXIX. FRIDAY, JANUARY 27, 1922. Price Fourpence.

Contents.

SUMMARY.

At the Royal Photographic Society last week, in connection with the exhibition of his portraits of "Men of Mark," Mr. Walter Stoneman delivered an interesting and humorous address recounting his experiences of sitters, famous, fair and funny. (P. 47.)

Almost the final stages in the incorporation of the Professional Photographers' Association were taken at a recent meeting of the council. (P. 55.)

We refer on page 45 to a little point of etiquette which surely should be strictly observed by photographers who wish to be regarded as "professional."

Those with a little mechanical aptitude and a modicum of skill in the use of size or oil colours, can readily make their own backgrounds. In an article on this subject we refer to other methods of preparing backgrounds and of introducing variations into them. (P. 46.)

The principles and practice of stereoscopic photography of small objects are the subject of a paper by the Rev. H. C. Browne, in which the optical and visual conditions which require to be observed in obtaining correct stereoscopic reproductions are considered in detail. (P. 50.)

The offset method of printing, which has been adopted by a northern newspaper, foreshadows revolutions yet to come in newspaper production. (P. 46.)

A photographic method, but one eliminating the use of a camera, is being employed in Germany for the production of re-editions of books, the type of which has been distributed. (P. 46.)

Some practical precautions in the use of the method of toning in which the bleached print is first treated in a diluted developer and then in sulphide, are recommended by the Eastman Research Laboratory. (P. 45.)

One or two hints for those beginning the practice of carbon printing will be found in a paragraph on page 45.

The photography of reflecting objects, making of cheap enlargements, measurement of effective diameter of a lens stop and methods of photographing shop fronts are among the subjects of brief replies to correspondents. (P. 60.)

The Bournemouth Camera Club has now its own permanent premises and work-rooms in the municipal building. (P. 49.)

An official service has been established in Italy for the supply of photographs of events, etc., in that country. (P. 57.)

A correspondent refers to the first text-book of bromide printing, written by Mr. J. Burgess for the firm of Morgan, afterwards Morgan and Kidd of Richmond. The date of publication, namely, 1880, establishes that of the commercial manufacture of bromide paper. (P. 59.)

The construction of an automatic printing and enlarging machine, in which a continuous band of sensitive paper is exposed, is the subject of a recent patent specification. (P. 52.)

EX CATHEDRA.

Sulphide-cum-Developer Toning.

It will be remembered that a useful variation of the sulphide toning process originated a year or two ago by the Kodak Company in this country consists in treating the bleached print with a dilute developer sufficiently to bring up the image of faint purplish tinge, then sulphiding in the usual way. This method of mixed toning has recently been the subject of a report by the Eastman Laboratory in Rochester, as the result of tests made with it on Artura and Velox prints. As a result, it is recommended that the artificial illumination of the room in which prints are handled up to the stage of taking them out of the developer should be kept constant. While any ordinary developer may be used, provided that it is sufficiently diluted and used only for one batch of prints, a formula that is specially recommended is one containing only 1 per cent. of hydroquinone, 1 per cent. of anhydrous soda sulphite and 4 per cent. of borax. Obviously, in order to secure an even tone throughout a batch of prints, it is of special importance to stop the redevelopment of the bleached prints at the right point. The Eastman Laboratory finds that preliminary trials are essential in order to find the best degree of development. The time and temperature should be noted for a particular emulsion and negative, and these data adhered to in the subsequent use of the same developing formula. If this is done it is quite practicable to duplicate on any subsequent occasion the excellent tone which the process yields.

* * *

A Point of Etiquette.

We heard the other day of a little incident of a kind which ought not to happen if photographers observed in practice the claims which they make for their occupation as a profession. A customer had made an appointment for a sitting at studio X at a certain time. By inadvertence he made his way into studio Y, situated a few doors away. Announcing that he had come to keep the appointment, he was received as a matter of course, and the portraits duly made. It was not until afterwards that he discovered his mistake. We are not concerned with the business dispute between the two photographers, or with the question whether the sitter has or has not given an order to studio Y nor with the question whether studio Y has any rights of reproduction in the photographs made in the circumstances we have mentioned. But it is desirable to emphasise that portrait photographers, if they wish the public to recognise them as professional men, should observe a code of etiquette which certainly should render impossible the surreptitious taking of an order which belongs to another studio. It ought to be obvious to anyone who snatches an order which comes his way through such an error on the part of a sitter, that he does harm not only to himself but to the status of professional photographers generally. The customer is not

likely to think very much of him, and, reasoning from the particular to the general, is inclined to put down photographers in the mass as little men who are not above taking an underhand advantage of each other.

* * *

Tyros in Carbon. Not the least of the merits of the flexible negative film is its adaptability for carbon printing by the single transfer process. When the carbon print is developed direct upon its permanent support its production is little more difficult than that of a toned bromide print, and given a negative of good average quality the results are vastly superior in appearance. There is no uncertainty as to colour, and there is a large range in surface and colour of the final support. There are a few points which should be noted by those who have not yet tried carbon printing. One of the most important is that a contrasty negative is not necessary nor even desirable, although a hard negative will give a better result in carbon than in any other medium. Another, is that the beginner should use only ready-sensitised tissue, so that he is not handicapped by drying troubles at the outset. A third, is that over-printing which necessitates the use of very hot water in development should be avoided. Obtaining correct exposure is not easy at first, and the beginner should use as well as the tint actinometer, a pilot negative, equal in density to that being printed from. A small piece of P.O.P. printed to a light proof depth will take about the same time as fresh carbon tissue.

* * *

Photography and the Printing Press. Perhaps those who read our short paragraph last week on the photographic method employed for the production of a weekly newspaper, "The Blackpool Times," may not have sufficiently appreciated the developments in printing which it foreshadows. Briefly, the process consists in setting up the letterpress in type, photographing the latter on wet collodion, and from the negative printing on to sensitised zinc or aluminium. The inked-up impression on these plates, as also that on similar plates prepared from the photographic illustrations, is transferred to the actual printing surface and the offset impression thus applied to the paper. Apart from the advantages which we mentioned last week, no doubt one of the first things which will occur to the technically-minded reader is that the process of setting up letterpress in metal type and taking a proof of it is a costly method of providing an original for the camera. Nevertheless, at the present stage in printing houses it represents the readiest procedure which can be followed. But, as has been suggested not so very long ago, inventors are at work on the problem of eliminating the type-setting part of the process altogether and of providing, by mechanical means, a system which can produce more cheaply the required original which is to be photographically copied. The problem is surrounded with innumerable difficulties, as any printer realises; and we do not suppose that type-founders or printers' compositors are yet quaking in their shoes for fear that their occupation is to be taken from them by a photographic process for the production of an original for the offset printing machine. Nevertheless, the future will almost certainly witness great developments on these lines.

* * *

Photo-Copied Books, Apropos the part which photographic methods are playing in letterpress printing, an example recently came under our observation of the commercial use in the production of books of a photographic process which we described a few months ago, namely, the Manul process which has been developed in Germany by Max Ullmann. Manul, as we pointed out in our issue of October 28 last, is a variation of the old Player-type process, permitting of photographic copies being made by contact printing from letterpress which is printed on both sides of the paper. In place of a bromide or gaslight paper, as in the Player-type process, Herr Ullmann uses a film of bichromated albumen. We did not know, however, that the process was finding commercial application until the other day, when we received a re-edition of a technological dictionary issued originally by a Munich firm in 1910. The later (1921) edition is described on the title page as produced by the Manul process; that is to say, the printed pages of the original edition have been photographically reproduced without the use of a camera, and by this means the extremely heavy costs of re-setting again in type or, alternatively, photographing with a lens have been eliminated. The sharp impression throughout 1,322 pages of closely-printed letterpress, containing also many hundreds of fine drawings, is as good as could be wished, and affords an illustration of the great value of the process for the production of facsimile reprints of books, the type of which has been distributed.

HOME-MADE BACKGROUNDS.

Now that the scenic background has almost passed into the limbo of forgotten things, it should not be a difficult matter for the photographer to provide himself with a selection of useful and presentable backgrounds for a very small outlay on materials, the work being his own in spare hours. It is now generally agreed that it is most convenient for each background to be stretched upon a frame which is supported by feet which may run upon castors or, what is cheaper, the largest size of the polished knobs known as "domes of silence," which may be obtained of any ironmonger. If it be decided to make one's own frames, rough battens, three inches by one, will be strong enough. The corners may be morticed or "halved," and at each angle a brace about a foot long should be fixed flush with the general surface, these being cut from the same sized battens. The feet should be triangular, about fifteen inches wide at the base and ten inches high, and should not be fixed until the background has been stretched and painted.

For most work, eight feet by six feet is a convenient size, as this is wide enough for one or two figures, and is much easier to handle than the usual standard of eight feet each way. The most convenient material is strong unbleached sheeting, which may be obtained in various widths up to three yards. It should be turned over the edges of the frame and secured upon the one-inch side of the wood with tinned tacks, starting in the centre of each side and working to the corners so as to avoid creases. This can most conveniently be done with the frame lying upon the floor. Both sides of the frame should be covered with the calico. The next step is to give a sizing of starch made as for mounting, but rather thinner, the object being to prevent the distemper colour from being absorbed too readily by the material.

Ordinary size colour may be used for the final coating, but it will generally be found more convenient to purchase one of the ready-made mixtures which only require the addition of water. The colour should be applied sparingly with a flat brush, two thin coats giving a more even surface than one thicker layer. It is rather difficult to make a really black distemper; what is sold under that name dries a dark grey. This is greatly improved for photographic work by adding a certain proportion of dry Venetian red, from the oilshop, to the dry powder, mixing

it well before adding the water. It should be noted that distemper colour is much lighter when dry than when wet, so that it is necessary to coat a piece of brown paper with the mixture and to dry it at the fire before starting on the calico.

If it be desired to graduate the background or to work in a cloud effect the colour should be made with size and about three shades mixed separately, these being blended upon a large square of wood and worked into each other on the canvas. For this class of work the distemper should be kept until it smells rather disagreeably, when it will be found to work much more smoothly.

Oil colour may also be used upon the starch substratum and is much easier to work for cloud effects, as no allowance has to be made for drying. The ordinary tinned paints answer well if they are allowed to stand for a few days and the supernatant oil poured off, the colour being thinned down with turpentine only. This prevents gloss when dry.

A clean and easy way of making a background is to use the wide "art" serges which can now be obtained fairly cheaply. They are usually about fifty-four inches wide, so that a join may be necessary. If machined stitched and the seam pressed the join will not be visible upon the negative. Dark green and red for dark backgrounds and blue for a lighter tone are the best colours to select. A really black background which will give practically clear glass upon the plate is rather difficult to obtain, and so far nothing has been found to equal black velveteen. Even this reflects some light and it is liable to look rather patchy, unless it is kept well in shadow. In some studios it has been found necessary to add black side and top curtains, so that the sitter is in front of what is practically a black-lined box. Fortunately, this intense blackness is rarely wanted, the ordinary materials being dark enough with just a suggestion of atmosphere. Serge backgrounds have a very useful way of lending themselves to temporary modification, a little french chalk being dusted on to relieve the figure where necessary. When no longer needed the chalk is easily removed with a clothes brush. It is rather important to use french chalk or talc, as ordinary chalk or whitening cannot be removed so easily. An even more evanescent method of obtaining a graduated background was introduced by M. Adam Salomon. It consisted merely of moving a white card up and down behind the sitter during a part of the exposure; although it necessitates the presence of an assistant, this simple dodge is worth remembering.

A pleasant variety may be introduced by using a draped background which is easily done by fixing a curtain pole and brackets at the top of a background frame. When needed, a plushette or serge curtain may be affixed to this and used either in straight folds or looped up as fancy may dictate. Very bold patterns in serges and cretonnes may be used with good effect.

The number of tones available may be greatly increased by judicious placing of the ground. Taking one position as normal, it will be found that a lighter shade is obtained by turning the surface towards the light, and a darker one by turning it away. Anyone who has not observed this will be surprised to find how, when the shadow side of the face merges into the background, it may be made to appear in relief, either darker or lighter than the ground by this simple device. It is here that the full value of the movable background frame is seen to advantage.

It is hardly necessary to point out that the end walls of the studio should be finished, so that they will serve as backgrounds for large groups. This may be done by artistic paper-hanging, or by fitting oak panelling or one of the imitations such as Linerusta or Anaglypta.

FACES IN THE STUDIO.

Mr. Walter Stoneman, whose "Men of Mark" have attracted much attention at the Royal Photographic Society, gave a lecture in the Society's house on January 18 on "Faces, Famous, Fair, and Funny." The chair was taken by Mr Furley Lewis, who got a special dispensation from his doctor in order that he might be present to extend a welcome to a brother portraitist. Many illustrious victims, he said, had fallen to Mr. Stoneman, who no doubt felt as he did that one came just about as near to human nature in studio portraiture as one could do anywhere.

Mr. Stoneman, in opening his lecture, said that the photographic studio was one of the most interesting places in the world. There one could really and truly see life—men, women, children and dogs. He began with a doggy story. Some years ago a very distinguished lady came to the studio accompanied by a huge boarhound. Somehow the dog could not be induced to take a natural pose. He himself at that time was doing the focussing, while the operator was attending to the posing. With his head under the cloth, he made a low growl, with the object of inducing the animal to look more intelligent, whereupon the boarhound sprang, not at him but at the poor operator. The operator was a brave man, and stood perfectly still, so that the animal leapt beyond him but he said that if that incident was going to be made again he would prefer to be behind the camera.

But to return to faces. Every face was absolutely different. No two faces in the world were alike. He had photographed 25,000 people in the last twenty-five years, and he had never seen any face which was a perfect likeness of another. Sometimes, however, the resemblance was very close. Recently two brothers visited his studio, and when he saw them he glanced from one to the other and could not imagine why there were two. He told the operator to be sure not to photograph one of them twice by mistake, and actually after he had photographed one brother he had to ask him kindly to leave the studio so that he might be sure that he was photographing the other. When it came to the negatives there was no discoverable difference in the faces; only the clothing indicated which was which.

The face, of course, was only one medium of expression. What attracted us in our friends was perhaps rarely their faces, but more generally their voice, their manner, their character, and the less superficial side of personality was not easily conveyed through the camera. That was no fault of the operator—horrible word, enough to prejudice the whole business to start with—nor was it any fault of technique; it was simply that the human face, especially in rigid repose, expressed so little. Hence the expression "I never make a good photograph," which paralysed the creative faculties of the photographer at the very commencement. If the photographer was quite candid he would say to some people, "And you never will," and if he was ultra-honest and had not got a wife and family to support he would add, "It is on account of your face." That did not mean that the personality was uninteresting. Under the stimulus of enthusiasm the plainest face became transfigured and were no longer

a mask. And as for the people whose features made good photographs—well, he would not care to live with some of them.

All this was specially true of women. The personality of women was elusive. A certain charm about them, like a musical voice, was unphotographable, though, apart from the features, there were certain things which helped the photographer, such as the figure and the dress. Often in the old days had he sighed for the opportunity of photographing women in colour, and, of course, this was now possible. He wondered why his brother photographers did not make more use of the Autochrome. It was perhaps not very profitable, but it was wonderfully interesting. In men the figure and the dress were of minor importance; though, of course, a uniform or a smart suit were sometimes valuable—they took one off the face! In this connection he referred to the wonderful article by Mr. Pirie Macdonald in that week's "British Journal of Photography." It was very American, though none the worse for that, and very attractive. He called it "The Trick of Taking Men," and personally he already owed Mr. Macdonald quite a great deal for the stimulus of that article.

The Famous.

In describing some of his famous sitters, confining himself to those he had personally taken, Mr. Stoneman began with His Majesty. He first photographed him as Prince of Wales, and the Queen as Princess, fifteen or twenty years ago at Mount Edgcumbe, in Devon. The photograph was taken at half-past five in the afternoon, and, with what he thought in those days was great expedition, he had the proofs ready by ten o'clock the same night, and was wandering about the dark quay looking for a boat to ferry him across to where their Royal Highnesses were staying. He last saw the King at Sandringham, where he appeared like a happy country squire, and, meeting him in the road, King George asked him a few questions and wished him good luck. On one of his visits to Sandringham they sent a royal car to the station to meet him, and he got a number of salutes from passers-by in consequence, but on another occasion, when he was commanded to photograph the King of Norway there was some mistake as to which of the two little stations he should arrive at, and, getting out at the wrong one, he found no conveyance available, and had to walk three and a-half miles to the house, with the result that he was half an hour late, and the King, a stickler for punctuality, was perturbed, as he was himself. However, he got to work, and both King Haakon and Prince Olaf shook hands with him at the close. He had shared the honour of photographing the Prince of Wales with other London photographers and some thousands of his future subjects. The Duke of York and Prince Henry were both excellent sitters. On one of his visits to Buckingham Palace Princess Mary was present, and the Duke of York told her that Mr. Stoneman ought to photograph her, but she replied that he had already "done a very nice one of her," on horseback, at Sandringham.

Mr. Stoneman had a good deal to say about admirals, especially the late Marquis of Milford Haven, a very handsome and most kindly man. On one occasion, down at Devonport, he (Mr. Stoneman) was not merely given the privilege of photographing a launching platform, but was also given the delicate duty of choosing three other photographers to share the privilege. He found, however, in looking after his colleagues and competitors, that he had lost his own position, but a friendly admiral stopped him when he was going away with his camera in disappointment and took him to a much better perch, where he got such pictures of royalties as subsequently occupied full pages in the illustrated papers. There was a moment's perturbation, however, when the admiral in command, Prince Louis of Battenberg, as he was then, spied him in his close-up position, and the proceedings were nearly interrupted, but the admiral who had got him the place explained matters, and, with bows and smiles, the Prince allowed him to remain.

Other admirals who had given him sittings included Admirals Tyrwhitt, Keyes, and Reginald Hall. The last-named looked after the spies in the war, and when he sat in the studio he gave as an excuse for not assuming a more vivacious expression that his head was chockful of secrets. Perhaps the most characteristic of all these sea-dogs was Sir Charles Beresford. On the first occasion when he photographed him he had the camera all ready, because he had heard that he was a hasty subject, and Lord Charles walked down to the spot, buttoning his gloves, asking where it was desired that he should stand, and saying that he could only give one plate. The moment the exposure had been made he walked off, wishing the photographer success, a wish which the photographer echoed, although he doubted. But his lucky star was in the ascendant that day, and when, twenty years later, he photographed Lord Charles Beresford in the studio the admiral told him that he was still ordering that early photograph. Mr. Stoneman was struck with the modesty of naval and military figures, perhaps because one specially admired a virtue one did not oneself possess. Modesty was scarcely a photographer's characteristic. Lord French and Lord Haig did not appear to care for photography, but all five army commanders faced his camera during the war.

The best of all sitters was the present Prime Minister, whose picture dominated the photographs on the walls. A photographer had no politics, but he could not help saying that it was a statesman's face that looked out at one there. About sixteen years ago he photographed Mr. Lloyd George in a friend's garden. The garden was not very level, and the chair not very comfortable. Before exposing he said to Mr. Lloyd George, by way of suggestion, "A winning smile?" There was a General Election on at the time. "Steady," replied the future Premier, "let's get a safe seat first." At the close Mr. Lloyd George went up to the photographer, and said, "Who's going to win Devonport?" Mr. Stoneman robbed him of any illusions by telling him, "Not your lot." Speaking of Sir Eric Geddes, Mr. Stoneman got back among his favourite admirals. During the war he received a telephone message from the secretary to Sir Eric Geddes, telling him to come down and take a group. He went down, and at the back of the house in Queen Anne's Gate he found a group of all the Allied admirals—English, French, Italian, Japanese, and American (Sims)—and he himself the only photographer. Nobody knew that the admirals were in London, and he was not allowed to release that picture until twenty-four hours after they had gone away.

Among the peers one did not now find the type of aristocrat who flourished twenty-five years ago. Of all his sitters peers least looked the part, and on one or two occasions he had had to refer to his appointment book to make sure as to the identity of his sitter. Labour members had striking faces, and showed in many cases marks of their early toil. He remembered one of them whose face—and, as he told him, the upper part of whose body—was disfigured by a multitude of tiny black marks, the result of the impact of little pieces of coal while he was working in the mine with his pick. Time failed to tell of the bishops, who had visited the studio by the dozen. A photograph at Lambeth Palace, when 240 right reverends were present, was familiarly known as "yards of bishops." One of the bishops who was taken separately, thinking the photographer must be growing weary of the ecclesiastical face, said as he left the studio, "You must be tired of us blooming bishops." Free Church ministers were, as a rule, rather more approachable. Scientists had expressive faces, but were not particular about their clothes. It must not be imagined that it was only the ladies who were vain. Once he opened a dressing-room door, and found the gentleman who was about to be photographed gazing at himself in the mirror with his moustache in curling pins! An officer who came with his servant rapped out questions

between each exposure, "Is my hair straight? . . . My coat right? . . . My tie straight?" Authors were easier to photograph than authoresses. He asked Conan Doyle whether he did not feel particularly at home in Baker Street, and the creator of Sherlock Holmes said that he did. Mr. Burgin said that he spoke to a policeman in the street, "Can you give me 73, Baker Street?" and the policeman replied, "I am afraid I can't, sir, Russell's have got it." He anticipated a visit from W. W. Jacobs with much pleasure, but the author arrived with an air of gloom and resignation that would not have disgraced an undertaker. After exposing two plates, the photographer remarked that he thought the funeral was proceeding satisfactorily, but that he could have wished for a more lively corpse. Afterwards Mr. Jacobs told him one or two original stories, and he was able to get a more satisfactory picture.

Before leaving the famous for the fair, Mr. Stoneman spoke of how greatly men appealed to him as sitters. Why did men neglect the studio? He believed they had an idea that the photographer still used the head rest. At any rate they were sure that they could be photographed equally well walking about—an idea encouraged by press photographers. Some men told him that they had not been in a studio for twenty years, and said it as though it were praiseworthy on their part. The Professional Photographers' Association ought to engineer a Bill through Parliament to compel every man, woman and child to be photographed every three years at least. That would be very useful and good work for the Association. After all, a good photograph was a priceless thing. When we passed away our personality faded: there was only a memory left, but that memory was best revived by the photographic resemblance. The most precious thing to many people was a photograph of someone whom they had lost, and it was a man's duty to his children to leave them this heritage.

The Fair.

Among fair sitters he placed first of all Queen Mary. He counted it one of his greatest privileges to have spent a morning at Sandringham in her company, and to have photographed her on three occasions. Of Queen Alexandra's charm he did not need to speak. She once came out to be photographed with old Sir Dighton Probyn, and although he got a chair for her she made him sit down while she stood, and they were photographed together. Other royal ladies whom he had photographed were Princess Mary and Princess Arthur of Connaught, the latter as a nurse making a charming picture. Of the lady members of the House of Commons, Lady Astor was too vivacious in personality, too full of life and enthusiasm, to make a really good photograph. Mrs. Wintringham, M.P., belonged to an entirely different school; he was immensely impressed by her personality. He had not photographed Mrs. Asquith, and therefore could not expect to appear in her reminiscences. Authoresses were not good sitters, but they had afforded him some interesting hours in his studio. In the musical world he recalled photographing Madame Antoinette Sterling years ago, and from some fancied likeness to her son she took a fancy to him, and gave him much helpful counsel. In more recent days he had seen a good deal of Madame Clara Butt, whose husband, Mr. Kennerley Rumford, was a good amateur photographer, and if he did not make a mistake sometimes, such as in excessive economy, getting two pictures on one plate, he would ask him to join his directorate. He related an amusing story of how the Rumford family were photographed in the order of their stature. Madame Clara Butt, of course, was the tallest, but the father expected to be the second; his claims, however, were disputed by two of his children, and he was reduced to the fourth in rank!

Mr. Stoneman concluded this portion of his lecture with a reference to the children, the fairest of the fair, in the photography of whom he had revelled, and with whom he had sometimes played so long as to forget to make his record.

The Funny.

Without a sense of humour no one ought to be a photographer. Why, there was even a sense of humour in a convict prison. He recalled being present at a service at Dartmoor—he was there professionally, and not under duress!—when the organist played the "Wedding March" as the convicts went back to their places. He had been asked to say which of his portraits in the present exhibition was the funniest! If he answered such questions he would not be able to give any more free lectures, but would have to take collections to keep himself alive. All the laughter in the studio was not on the photographer's side. He had an old country couple up from Cornwall once, and the man started grinning. He took one photograph, thinking this was the natural expression, and then a second, and then he said, "Now, supposing we try a more serious picture." "Oh," said the man, "I can't help a-laughing, looking at you." There were plenty of humorous faces, but few comical ones. He used to think that Dickens exaggerated, but he believed that every character Dickens ever portrayed had passed in front of the camera these last twenty-five years. Occasionally a really funny sitter was encountered. One such was the late Sir Hiram Maxim, who was able to tell funny stories until he had thoroughly upset the gravity of the studio. Recently he had to photograph a very wealthy Jew, and found it difficult to get a characteristic picture. There was not the glamour about the face which one associated with money-making. Presently he said to his sitter, "I wonder if you could imagine yourself at your shareholders' meeting, announcing that the profits of the year ——." The Jew put his hands on the chair, assumed a well-satisfied expression, and ejaculated, "Millions." "Don't move," said Mr. Stoneman, who got a picture which was worth its weight in gold.

Sometimes men were ordered to the studio by their wives. One very distinguished diplomat years ago was brought to the studio by his wife, who left him sitting in the chair in front of the camera. Mr. Stoneman began to focus, while the sitter shifted uneasily, and before the work could be completed rose and said, "I suppose that's all, thank you very much" and trotted off down the stairs, Mr. Stoneman following. At the foot of the stairs he met his wife. He looked at her, he looked at Mr. Stoneman. He chose the lesser of two evils, and went back to the studio.

Mr. Stoneman concluded with a nice little exhortation to his audience to the effect that we were all responsible for the expression on our faces, that if we could not all be handsome we could all be good-looking, that the transient ugliness which came into our faces was of our own making, and that we had to beware lest the feeling which gave rise to a momentary expression of disagreeableness became habitual and so translated itself into the facial contour.

There was a very hearty vote of thanks.

Bournemouth Camera Club.—New headquarters have recently been obtained by this club on the lower ground floor of the Town Hall, where most convenient premises have been leased from the Corporation for the exclusive use of the club. They include a large club room, and developing and enlarging rooms, thoroughly equipped for practical work. The premises were officially opened last week by the Mayor, Alderman C. H. Cartwright, who expressed the pleasure he felt in supporting so admirable an educative enterprise. The new premises, which are available for the use of members every day from 10 a.m. to 10 p.m., will undoubtedly add immensely to the usefulness of the club, the annual subscription for which is only 10s. Particulars of lectures, demonstrations, and excursions may be obtained from the hon. sec., Mr. Francis G. Burroughs, 88, Old Christchurch Road, Bournemouth.

THE PRACTICAL STEREO PHOTOGRAPHY OF SMALL OBJECTS.

(*Continued from page* 36.)

The vertical space or frame thus marked out has a threefold function. It constitutes what will be called *object width*, which determines the whole width of the available space within which the object must be arranged. If the object is wider than this, only so much of it can appear in the stereo image as lies between the two verticals; if the object is to be taken as a whole, it should be considerably narrower than this, in order that it may be artistically displayed. For instance, in the first example about to be given, the *object width*, or distance between verticals is 7½ in. For effective display the actual object, or objects, should not be more than about 5 in. wide. There will then be sufficient room in which to arrange the group in a pleasing way. Artistry in stereo work is of quite as great importance as accuracy. The next function of the two verticals is that they form the plane of *object distance* on which focussing is to be done. The lens axis must be vertical to this plane, and the focussing screen must be parallel to it. The side movement of the camera between the first and second exposures must also be strictly parallel to this plane. The distance between the lens centre and the plane of the verticals is given in every case by the working formulæ and will be called *object distance*. The sharply-defined images of the two verticals must appear on the focussing screen at an exact distance apart, which is also given by the formulæ. This last distance will be called *print width*, and the greatest attention must be given to its accuracy, for on it the scale and distance of the stereo image will depend. This is the third function of the verticals. The prints have only to be made by contact from the negatives, trimmed along the images of the verticals, and mounted side by side with their inner edges touching.

It is important that the images of the verticals should run unbroken from top to bottom of both negatives throughout the height which will appear on the prints. No part of the object in front of the verticals must be allowed to infringe upon them in such a way that it comes between them and the lens and cuts off the view. Otherwise an effect of unreality at the edges of the image, well known to stereo workers, will result. With the exception of this proviso, however, the object may be placed anywhere within the limits of sharp focus. In general, perhaps it will be placed with one-third of its depth on the nearer side of the verticals, and the other two-thirds on the farther side; but if it is wished to concentrate attention upon the surface of the stereo image the object will be placed more or less in line with the verticals, with its main bulk behind them. It should be noted that the use of a small stop is indicated here, especially when a magnified image is to be obtained. The pupil of the eye is very small, and whatever the result of using a large stop may be it will not give a natural effect. The practical necessity of stopping down the lens before exposure in order to secure definition therefore agrees with the *a priori* requirements of theory. The object should not be placed on a wide table, but should be supported on a small block which is itself narrower than the *object width* or distance between verticals. This will make it easier to secure the unbroken image of the verticals on the negatives. A horizontal line, strongly marked on the face of the block, would be of immense assistance in the proper trimming of the prints, as they could be trimmed off along the image of this line, and another difficulty, familiar to stereo workers, would then be removed.

The last part of the photographer's problem is to determine what amount of shift must be given to the camera after making the first exposure, in order to secure the correct degree of perspective relief in the image. This also is given by the formulæ, and will be called *lens separation*. It only remains therefore for the worker to make sure that he moves the camera through exactly this distance. If an ordinary folding camera is used it will be better to attach it squarely to a small rectangular base whose edges may serve as guides. A slip of paper longer than this base should be marked with two parallel lines drawn at *lens separation* apart. An edge of the camera base should coincide with one of these lines for the first exposure, and afterwards moved until it coincides with the second line. Two drawing pins will hold the paper in position during the operations. Great care should be taken that the camera is not moved forward or backward in the slightest degree, and that in changing the plates the adjustment between lens and focussing screen is not disturbed. In the following examples the camera extension or distance between focussing screen and lens centre is given for the convenience of the worker, and assuming that the lens used is accurately 2½ in., this will obviate a good deal of tentative focussing and movements of the camera. If a beginning is made with No. 2 example, where the extension is 3 in., and a mark is put on the focussing scale or other convenient place, the other extensions of 3⅛, 3¼, and 3¾ can be readily adjusted, and the camera may simply be pushed forward towards the verticals until they are in focus. Focussing might be done on a strongly-lined screen temporarily placed in the plane of the verticals, and the supporting block with the object arranged on it afterwards put in position. A pair of compasses, with the points set at *print width* apart, should be used to test the accuracy of the distance between the images of the verticals on the focussing screen. Until this has been satisfactorily secured no exposure should be made.

One more question. Plate or film for the negatives? Without any reference to a recent rather heated controversy, and independently of the respective merits of the two, the nature of the problem before us gives a very definite answer, and indicates that here film negatives will be most convenient, especially if positive transparencies are to be made for use in the stereoscope. Instead of trimming the prints we can then trim the negatives themselves by cutting away all the film that lies outside the images of the vertical lines. The negatives can then be placed side by side on the paper or other surface on which the positive is to be made, and a stereo print directly ready for viewing can thus be obtained by a single exposure. In order to avoid the danger of confusing the left and right negatives a slight modification of this method will be advisable, which will permanently record on each negative the side to which it belongs. For the left exposure a small card bearing the letter L should be placed close to and at the outer side of the left vertical, and removed as soon as the exposure is made. For the right exposure a similar card, marked R, should be correspondingly placed at the outside of the right vertical. There will always be plenty of room on the negatives for the images of these letters, and only one end of each negative—the end not bearing the letters—should be trimmed off. When the two trimmed edges of the negatives are placed in contact they will be in correct position for printing, and no mistake can be made. This will also obviate the necessity of handling the actual part of the negatives which is to form the prints, and the untrimmed ends will provide a convenient means of shifting the negatives into position for printing. No doubt a worker who is expert in the use of a diamond will be able to trim glass plate negatives quite as accurately as films, and if Autochrome transparencies are to be produced this will be necessary. When a series of experimental protographs is to be taken of the same group of objects, as may very usefully be done in the present instance, it will be well to add a distinctive number or mark of some kind under the letters L and R for each pair of exposures, in order to identify them and avoid con-

fusion. The visual difference will sometimes be very small. Unless some precaution of this kind is taken the photographer may inadvertently find himself responsible for the mixed marriages of stereo couples that nature never intended to be joined together.

The mounting or making of the prints side by side and in contact has been assumed so far, because this is the simplest and surest road to accuracy. It is not, however, quite an ideal method, as the eye detects something like unreality where the two prints meet. In mounted prints it will be better to cut an additonal 1/16 in. off both edges of each print, and mount them ¼ in. apart. This will preserve the correct distance between corresponding points in the prints. Transparencies or direct prints should be covered with a mask having two openings whose width is ¼ in. less than that of the prints, and separated by a distance of ¼ in. at their inner edges.

The writer is sensible that the above working hints are only a kind of rough outline of the method by which the photographer may proceed to translate the formulæ into action. They are such suggestions as naturally occur to one with considerable past experience in rigging up apparatus to suit the needs of the moment, but who is at present restricted to the use of a pen. By the time two or three experimental exposures have been made the worker will have attained facility in the routine of operations, and will be very much wiser than his present instructor. At the outset, however, the indications of procedure above given may be of use.

In the following table fractional values are expressed as decimals, and the worker is supposed to have provided himself with a rule divided into tenths and hundredths of an inch, and with needle point dividers by which he will be able to lay off the distances accurately. Just as, when trying a new developing formula, he is careful not to allow a deliberate error of a single grain or minim to enter into his measurements, so he is expected conscientiously to aim at accuracy in the present instance, in order that the method may have fair trial.

Table giving five examples to be taken with 2½ in. lens

Note.—*Object width* = horizontal distance between vertical cords or wires.

Object distance = distance of the camera lens from the plane of the verticals.

Camera extension = distance between focussing screen and lens.

Print width = distance between the images of the verticals as seen on the focussing screen

Lens separation = amount of side shift to be given to the camera.

Of these dimensions the *object distance* and the *camera extension* (which are really only given for convenience) will vary if the lens is not exactly 2½ in. in length The three critical dimensions which must never vary are the *object width*, *print width* and *lens separation*. For a purpose which will be explained below, two additional examples are given. Nos. 6 and 7, which require a 3 in. lens. The distance of the resulting image is given under the letter *x*, and its scale under the letter *n*. In the third example, for instance, *x* = 16 and *n* = 2. This means that the image will be 16 in. from the eyes, and twice natural size. The dimensions are given from left to right in the order in which they claim the attention of the worker.

	x	*n*	Object width.	Object distance.	Camera extension.	Print width.	Lens separation.
(1)	12	1	7.5	12.5	3.12	1.88	2.25
(2)	16	1	10.0	15.0	3.0	2.0	2.33
(3)	16	2	5.0	8.75	3.5	2.0	1.16
(4)	20	3	4.16	7.5	3.75	2.08	0.8
(5)	36	5	4.5	7.5	3.75	2.25	0.5
(6)	20	1	12.5	21.0	3.5	2.08	2.38
(7)	36	1	22.5	33.0	3.3	2.25	2.47

Examples 3, 4, and 5 will show how completely the realisation of these results will depend upon the eyes. In these three cases the scale of the prints is almost the same; in 4 and 5 it is identical. The prints only differ from each other in width, which determines the convergence of the eyes, and in the amount of perspective change between the left and right views. If the observer has to adjust the focus of the stereoscope to suit his sight, and not to suit the image—and this of itself will indicate defective vision—there is very little left by which he can judge. But the optical facts put before him will be accurate, and whether he realises it or not, the image he sees is that which the worker sought to produce: the *technique* will be correct. Nos. 1, 2, and 3 should certainly be successful. No. 4 is doubtful. No. 5 may be regarded as an attempted *tour de force*, intended to test the space limits to which enlarged images of this kind can be successfully projected, and probably to show that these limits have been passed. The taking of No. 5 will give very little trouble, as the camera adjustments and distance are the same as No. 4, and it is hoped that the experiment will be made. In general, enlarged images will only be called for at near distances, and it will be seen later that by the use of a shorter focus lens any degree of magnification can be obtained and the image brought close to the eyes.

It will be a quite different matter, however, when natural-sized images of familiar objects are projected to these distances of 20 in. and 36 in., or even much farther than this; for then the mind can at once recognise what is presented and verify its impressions. Nos. 6 and 7, to be taken with a 3-in. lens, are arranged to correspond with Nos. 4 and 5, but the images are not enlarged. A natural history specimen would make a very suitable object in these cases. The inclusion of a section of an inch rule, graduated clearly, but not too closely—say, into eighths of an inch—would greatly assist the judgment when the image is to be natural size; but this would be quite fatal if the image is to be enlarged. In the latter case a reduced scale rule $\frac{1}{n}$ natural size should be attached to the object to be photographed, so that in the image (magnified *n* times) it will appear in its true dimensions and serve as a guide. In No. 5 a ¼ scale rule should be used, and it may be useful to point out that this can be obtained at the same time that No. 2 is taken, as the negative here is exactly on a ¼ scale. A little ingenuity will enable the worker, by incorporating the image of an inch rule on some waste portion of his negatives—say, on the edge or bottom that is to be cut away—to provide himself with a series of rules of various proportions which will be available for this purpose when magnified images are to be obtained. This dodge for assisting the judgment would seem to be legitimate, and may be found to be necessary

The accuracy of a suggested procedure can quite satisfactorily be tested by finding out whether certain predicted bad results will follow any departure from it. What will happen if we use an entirely wrong lens for taking the negatives? The first effect will be that *object distance* and *camera extension* will vary directly in proportion to the focal length. As regards the image its *depth* will vary inversely to the focal length; its width, height, and distance will remain unchanged. If a 5 in. lens is used for examples 1 to 5, the depth in every case will be only half what it should be—a fully drawn-out concertina will appear half closed. If the 2½-in. lens is used for examples 6 and 7 the depth will be increased by one-fifth. Any lens whatever may be used in any particular case, but only one lens will give an absolutely correct result. This note is added for the benefit of those who wish to try the method, but who may not find it convenient to procure special lenses for the purpose. H. C. Browne.

(To be continued.)

Photographs of War Memorials Wanted.—For the compiling of a photographic record of all war memorials erected in the United Kingdom and Colonies, the Imperial War Museum, Crystal Palace, S.E., requests all authorities concerned to kindly supply photographs. These should be on mounts 8 inches by 5 inches, with the date of the unveiling ceremony, name of sculptor, and any other details of interest inscribed on the back

FORTHCOMING EXHIBITIONS.

January 11 to 27.—Camera Portraits, entitled "Men of Mark," by Walter Stoneman, at the house of the Royal Photographic Society, 35, Russell Square, London, W.C.1.

January 21 to February 4.—Partick Camera Club. Particulars from the Hon. Secretary, James Whyte, 51a, Peel Street, Partick, Glasgow.

February 7 to 11.—Sheffield Photographic Society. Particulars from the Hon. Secretary, James R. Wigfull, 14, Parade Chambers, Sheffield.

February 11 to 25.—Scottish Photographic Salon. Particulars from the Secretary, James F. Smellie, Braefindon, Allanshaw Street, Hamilton.

February 14 to 17.—Exeter Camera Club. Latest date for entries, January 30. Particulars from C. Beauchamp Hall, Hon. Exhibition Secretary, Exeter Camera Club, "St. Denys," Bellevue Road, Exmouth.

February 18 to March 4.—Edinburgh Photographic Society. Latest dates, entry forms, February 4; exhibits, February 9. Particulars from the Hon. Secretary, G. Massie, 10, Hart Street, Edinburgh.

March 1 to 6.—Birmingham Photographic Society. Latest dates: Entry forms, February 15; exhibits, February 23. Particulars from the Hon. Secretary, P. Docker, Medical Institute Buildings, Edmund Street, Birmingham.

March 4 to 25.—South London Photographic Society. Particulars from the Hon. Secretary, Harry Abbott, 61, Beauval Road, East Dulwich, London, S.E.22.

March 8 to 9.—Birkenhead Photographic Association. Latest date for entries, February 25. Particulars from the Exhibition Secretaries, Messrs. Longstaff and Trace, 33, Hamilton Square, Birkenhead.

March 14 to 16.—City of London and Cripplegate Photographic Society. Latest date for entries, March 4. Particulars from the Hon. Secretary, J. J. Butler, 7, Gresham Street, London, E.C.2.

March 15 to 26.—Welsh Salon of Photography. Latest date for entries, March 9. Particulars from the Secretary, H. G. Daniel, 154, Penylan Road, Cardiff.

March 28 to April 1.—Hackney Photographic Society. Hon. Secretary, Walter Selfe, 24, Pembury Road, Clapton, London, E.5.

April 5 to 8.—Leicester and Leicestershire Photographic Society. Latest date for entries, March 22. Particulars from the Hon. Secretary, W. Bailey, Cank Street, Leicester.

April 21 to May 11.—Hammersmith Hampshire House Photographic Society. Latest date for entries, March 30. Particulars from the Hon. Exhibition Secretary, J. Ainger Hall, 26, Bishop's Mansions, Bishop's Park Road, London, S.W.6.

May 1 to 6.—Photographic Fair. Horticultural Hall, Westminster. Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1.

September 18 to October 28.—Royal Photographic Society. Latest date for entries by carrier, August 25. Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

TRANSPARENT PANEL ENVELOPES.—In a notice which was recently issued by the Postmaster-General reference was made to the introduction of more stringent regulations affecting the use of transparent panel envelopes. Those regulations, which came into force on January 1 last, are not being generally observed, and, in consequence, many letters in panel envelopes are being stopped in the post. The Postmaster General therefore wishes to draw renewed attention to the restrictions. The transparent panel must form an integral part of the envelope and must be parallel to the longer side, so that the address appears in the same direction; it must be placed so as not to interfere with the impress of the date stamp, and must be of a substance that will take writing. Articles forwarded in envelopes with a transparent panel must be registered. As a modification of the conditions, the Postmaster-General has arranged that in the case of envelopes addressed to any part of the British Empire or to the United States of America the panel need not form an integral part of the envelope.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, January 9 to 1 :—

FILMS.—No. 791. Treatment of photographic films with solutions.—R. E. Crowther.

COLOUR PHOTOGRAPHY.—No. 1,052. Manufacture of multi-colour screens for natural-colour photography.—P. Faulstich.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1s. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

PRINTING AND ENLARGING MACHINES.—No. 170,427. (July 30, 1920). The invention relates to photographic printing apparatus in which one rotation of an actuating shaft effects a complete cycle of operations, the shaft having mounted thereon cams which operate the contact plate for pressing the intermittently fed continuous strip of sensitive paper against the negative, and which (also while the paper is stationary) actuate mechanism to automatically switch on and off electric lamps contained in an enclosed chamber, means being provided to regulate the duration of the exposure.

The closing down of the presser plate is affected mechanically by the rotation of a cam shaft by which rotation pneumatic means for closing the electric circuit (thereby switching on the light) are simultaneously operated.

A machine provided with mechanism according to the invention is illustrated in the accompanying drawings and will be described in relation thereto.

The machine is constructed with a table top 8 supported upon a framework 9 within which is fixed a box 10 forming the printing frame and opening at its top through the table top. When the machine is used for ordinary printing the frame has

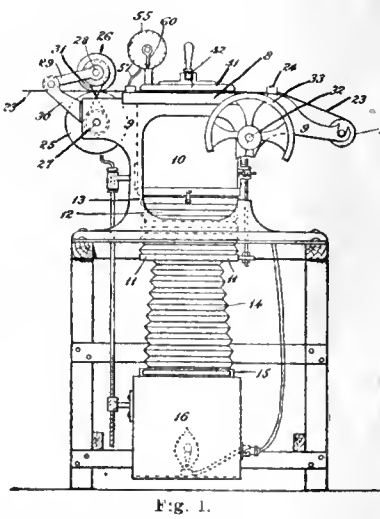


Fig. 1.

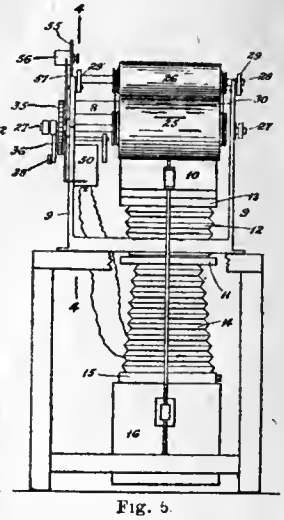


Fig. 5.

a negative holder placed within its open top: if it is desired to use it for enlargement work an enlarging apparatus is secured to the opened bottom end of the frame as shown in figs. 1 and 5.

For contact printing, the enlarger is removed and the open bottom of the box 10 covered so that this box then serves as the light box to throw the printing light up through the negative placed in the open top thereof.

The enlarging apparatus comprises a lens frame 11 connected by bellows 12 with an upper frame 13 and by bellows 14 with a negative slide holder 15 and light-box 16 below. The lens frame 11 and the light-box 16 with the negative holder 15 are relatively adjustable in their distance from each other and from the top of the printing frame so as to vary the size of the

image thrown by the negative through the open top of the printing frame

The strip of paper 23 passes from the roller 22 through adjustable guide blocks 24 along the top of the table 8 and across the open top of the printing frame.

At the other end of the machine frame are arranged the feeding rollers 25—26. The roller 25 has a spindle 27 mounted in the frame 9 and the roller 26 is carried on a spindle 28 mounted in arms 29 pivoted to brackets 30 upon the frame 9, so that this roller rests with its weight on the periphery of the roller 25 in

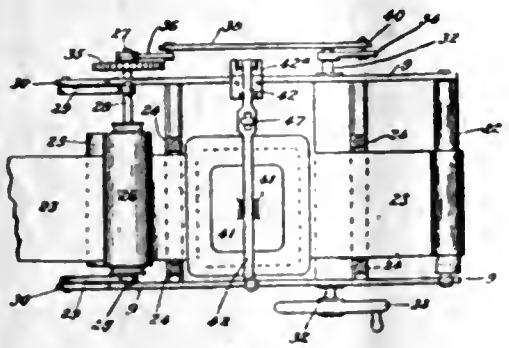


Fig. 2.

order thereby to effect a grip upon the paper strip. The two rollers are connected by crossed belts 31, arranged one at each end, so that the rollers when rotated in the proper direction will draw the paper strip from the roller 22, across the table top and out through between them.

For operating the feed rollers 25 and 26, a power shaft 32 has a hand wheel 33 on its front end and a crank arm 34 secured on its back end (see fig. 3). The spindle 27 of the roller 25 has a ratchet wheel 35 secured upon its back end and an arm 36 mounted loosely thereon and carrying a spring-controlled pawl 37 which engages the teeth of the wheel 35. The arm 36 is connected by a rod 38 with the crank arm 34 so that by the rotation of the shaft 32 the arm 36 will be reciprocated and thereby turn the feed rollers intermittently. The amount of turning movement given to the rollers on each rotation and consequently the length of paper fed across the printing frame at each printing operation can be regulated by adjusting the point of attachment of the connecting rod 38 to the crank arm 34 by adjusting and securing a screw pin 40 in a longitudinal slot 39 in the arm.

A presser plate 41 is mounted above the top of the printing frame and is adapted to cover the whole opening thereof and make light-tight contact all round its edges. This plate is pivotally mounted upon a lever 42 extending from back to front of the machine and pivoted at its back end to a standard 42a so

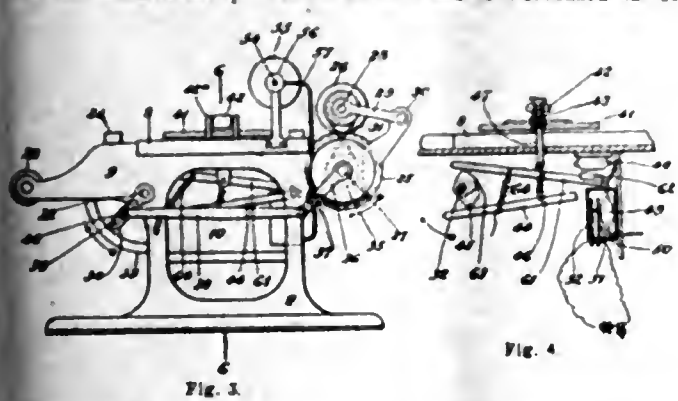


Fig. 3.

Fig. 4.

that it may turn up and down thereon. The pivotal attachment of the plate 41 to the lever 42 provides that when the lever is pressed down the plate will engage evenly around all the edges of the printing frame. The lever is kept normally raised free of contact with the frame by means of a spring 43. Thus the paper strip 23 may be passed beneath the plate 41 and fed across the table when the plate is thus raised. The plate 41 is depressed on to the frame and the light is simultaneously switched on at each printing operation in alternation with the feeding movements of the feed rollers 25—26 by means which will now be fully described.

These means are shown more particularly in figs. 3, 4 and 6 and comprise a lever 44 which is pivoted at one of its ends to the frame 9 and at its other end underlies a cam 45 secured upon the operating shaft 32. About midway of its length the lever is connected through a helical spring 46 with the lower end of a rod 47 which passes vertically up through the table 8 and is connected at its upper end to the presser plate lever 42. The spring 43 keeps the cam lever 44 drawn up against the cam 45 and the throw of this cam is so adjusted that the lever 44 will be depressed sufficiently to draw the plate 41 hard down on to the printing frame with a resilient pressure caused by the interposition of the helical spring 46 between the rod 47 and the cam lever 44.

The connection of the rod 47 with the lever 42 is made in such a manner as to provide for the lever being freed from the rod 47 in order to permit of the lever and plate being turned back on the hinge 42a to allow of the printing frame being arranged for printing. This may be effected for forming the rod 47 with a T head and passing it up through a slot in the lever 42 as shown in figs. 2 and 6 so that when turned across the slot it will engage the sides thereof and when turned lengthwise, the lever may be lifted clear of it. The spring 43 is kept in position by arranging it around the top end of the rod.

This operation of the presser plate 41 is adjusted to take place during the idle return stroke of the paper feeding mechanism and simultaneously therewith the light within the light-box is illumined for the predetermined period required for the exposure

The means for performing this latter operation are shown in detail in figs. 4 and 7 and consist in a rubber air bulb 48, having a non-return air inlet valve, of well known type, connected by tubing with a rubber ball 49 contained within a casing 50 fixed

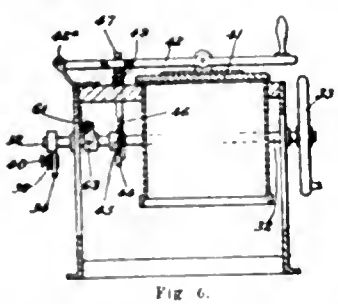


Fig. 6.

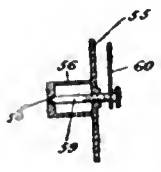


Fig. 7.

to the frame 9. Within the casing are arranged spring contacts 51—52 normally kept apart by their inherent tension and respectively connected with the two poles of the lamp circuit (as indicated by the diagram in fig. 4). The ball 49 is positioned between the side of the casing 50 and one of the contacts 51 so that when expanded by the forcing of air into it, the contact 51 will be forced into contact with the contact 52 and thereby close the circuit. The air then escapes from this ball, to break the contact, through the valve 54 shown in detail in fig. 7. This is combined with an indicator dial 55 fixed to the back of the machine above the top thereof, the dial forming the front end of a small cylinder 56 into the side of which a tube connection 57 with the ball 49 enters. The back end of the cylinder 56 has a tapered aperture 58 therein and a needle valve stem 59 screws axially through the front end of the cylinder and enters this aperture so as close it more or less according to the position of the screw. The outer end of the screw is provided with a pointer 60 passing around the face of the dial 55. The positioning of this pointer at different positions upon the dial will therefore indicate different degrees of opening of the needle valve and consequently give an indication of the times taken in the escape of the air from the ball 49 when the needle valve is in such positions. Consequently, it becomes an easy matter to set the valve to provide for the lamp circuit remaining closed for any period desired after the ball 49 has been inflated to close such circuit.

The rubber air bulb 48 is compressed to close the lamp circuit by means of a lever 61 pivoted at about midway of its length to the frame 9. One end of the lever underlies the bulb 48 and has a bread plate 62 fixed thereon to engage the bulb and the other end overlies a second cam 63 fixed on the operating shaft 32. The latter end is spring-controlled by means of a

spring 64 connected to it and to the frame 9 so as to keep it in close contact with the periphery of the cam. The cam 63 is so shaped and is so adjusted on the shaft 32 that during the paper feeding portion of the rotation of the shaft the level 61 will be turned to free the bulb 48, and during the other portion of such rotation it will be turned by the spring 64 so as to engage and compress the bulb 48 in the required manner.

Thus the one rotation of the operating shaft 32 will effect at the required time the depression of the presser plate 41 on to the printing frame simultaneously with the operation of the exposure light.—Matthew Marrin Kulus, Karangahape Road, Auckland, New Zealand.

New Books.

THE RED BOOK.—The indispensable Red Book of the Affiliation of Photographic Societies has again appeared well in advance of the photographic season. Under the editorship of Mr. George Hawkings, its customary features have been preserved and extended, and its advertisement pages afford a wide survey of the requisites available for the amateur photographer. Landscapists will be interested in the little article in which M. Leonard Misonne tells of his aims in landscape work and of the technical processes he uses in producing the works of such distinctive charm by which he is known. It should not be necessary to point out that possession of the Red Book serves as a permit to photograph in many places in London and the Provinces. The volume also contains a long list of photographic lecturers and their subjects.

COMMERCIAL PHOTOGRAPHY.—Our publishers inform us that they have just issued a fourth edition of this little manual by "Practicus," dealing with the branches of practical work which customarily come within the scope of the commercial photographer The book is no doubt well known to many of our readers, since the sales of the three previous editions have been considerable. Still it may be pointed out that the manual advises on the choice of equipment for commercial photography and on the special manipulation for subjects, such as houses and gardens, shop fronts, paintings and furniture, machinery and motor vehicles, silver, china and glass goods, textiles and clothing, and has something to say on working-up for catalogue illustration and on the everlasting question of how much to charge. The fourth edition is issued at 1s. net, and is obtainable from Messrs. Henry Greenwood and Co., Ltd., 24, Wellington Street, London, W.C.2, price 1s. 3d. post free.

SOFT-FOCUS LENSES.—Although entitled "Soft Focus Effects in Photography," No. 184 of the "Photo-Miniature," just published, is substantially a manual of the properties and use of soft-focus lenses. Mr. John A. Tennant is to be congratulated on having brought together a great deal of information, æsthetic, practical and commercial, on this very topical subject. Situated as he is in the United States, he has been able to collect particulars of the many soft-focus lenses originated in that country. At the same time he has not neglected to report upon the instruments of British and Continental opticians The manual leads off with a short account of the genesis of the soft-focus movement in photography and then proceeds to consider the optical methods of producing such diffused definition, the special considerations required in the lighting of portraits, and the making of soft-focus enlargements and enlarged negatives from originals which were sharp in the first instance. Then follows a collection of opinions on diffused definition by professional portrait photographers and amateur pictorialists. The manual concludes with a survey of the soft focus lenses on the American and European market, and with a brief description of other devices for mitigating the acute definition of a perfectly corrected lens. In the latter connection it is interesting to notice that the Eastman Kodak Co. have at length placed on the market the diffusing discs of the kind originated for use with the Eastman projection printer. We believe those employed for the enlarging lens in this latter outfit were found not the best for direct use on a camera, and that the camera type, now being placed on the market, is the result of considerable further experiment. We are quite sure that both professional and amateur photographers will eagerly add this little handbook on a subject of great present interest to the many issues of the "Photo-Miniature," which in the past have provided much valuable help. Messrs. Houghtons, Ltd., 88-89, High Holborn, London, W.C.1, publish in this country, price 1s. 8d.; in America Messrs. Tennant and Ward, 103, Park Avenue, New York, price 40 cents.

New Materials.

CRITERION PROFESSIONAL MATT BROMIDE PAPER.—Professional photographers will appreciate the quality of the new paper just issued by Messrs. Criterion Ltd., Stechford, Birmingham, as "Professional Matt Bromide." For one thing, it has an excellent and distinctive matt surface, almost indistinguishable from the natural surface of the paper. It is also made in three grades of contrast—ordinary, hard and extra-hard—a very positive advantage in dealing with negatives varying considerably in vigour. The papers work with great cleanness in any of the ordinary developers, yielding prints of excellent black tone and purity of whites. Samples and prices are obtainable by *bona-fide* professional photographers on application to Messrs. Criterion Ltd.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, JANUARY 30.

Bradford P.S. "Portraiture." T. Lee Syms.
Dewsbury P.S. "Through the Grecian Archipelago." W. Butcher and Sons.
Kidderminster P.S. "One Man Show." C. A. Allen.
Leeds Camera Club. Demonstration Competition.
Southampton C.C. "Photographic Silhouettes." W. R. Olney.
South London P.S. "Snow Photography." S. Brigden.
Wallasey A.P.S. "One Man Exhibition." A. Howard.
Walthamstow and Dist. P.S. "A Walk in Wanstead Park." A. E. Farrants.

TUESDAY, JANUARY 31.

R.P.S. "Our Old Village Churches and their Story." Herbert H. Wrench.
Birmingham Phot. Soc. "A Holiday in Switzerland and Savoy." P. Roberts.
Bournemouth C.C. Members' Print Competition and Leicester Phot. Soc.'s Folio.
Cambridge Phot. Club. "Greenland." Prof. A. C. Seward.
Exeter C.C. Affiliation Competition Prize Prints.
Hackney P.S. "Bromide Printing." W. Selfe. "Self-toning Papers." F. C. Toye. "Gaslight Printing." A. B. Richardson.
Leeds P.S. "Oil Printing." H. Bradley.
Morley P.S "Through the Grecian Archipelago." G. H. Jessop.
Mottingham Phot Soc. Photographs by Mr. Fred Judge.
Nelson P.S. "Pinhole Photography and Salted Papers." W. Duxbury.
South Glasgow C.C. "Village Life and Sentiment." R. McMorrine.
South Shields P.S. "Thoughts on Landscape by a Portraitist." H. E. Galloway.
Stalybridge P.S. Annual Meeting.

WEDNESDAY, FEBRUARY 1.

Accrington C.C. "The Flora and Fauna of the Scilly Isles." G. A. Booth, F.Z.S.
Birkenhead Phot. Assoc. "Canyons of Southern France." G. E. Thompson.
Catford C.C. "Farm Life." Miss M. Oliver.
Dennistoun A.P.A. "Through the Grecian Archipelago." W. Butcher and Sons.
Edinburgh P.S. "Picture-making Methods." J. B. Johnston.
Halifax Scientific Society "Y.P.U. Portfolio."
Ilford P.S. "A Ramble Round Dorking." A. H. Redman.
Leicester Phot. Soc. "Amateur Photographer" Lantern Slides.
Partick Camera Club. Whist Drive.
Rochdale Amateur P.S. "The Making of a Fur Felt Hat." J. Butterworth

[illegible] Suburban P.S. "Modern Photo[illegible]." L. J. Hibbert.
Tunbridge Wells A.P.A. "Italy and [illegible]." E. R. [illegible].
[illegible]side P.S. "How a Reflex Camera [illegible] Made." W. Butcher and Sons.

THURSDAY, FEBRUARY 2.

Camera Club, The. "The Cathedrals of Northern Spain." [illegible] H. Weaver.
[illegible]stead C.C. "Lantern Slides." J. Simpson.
Hammersmith Hampshire House P.S. "The Romance of London Streets by Day and Night." A. H. Blake, M.A.
Wimbledon and Dist. C.C. "Our Old Village Churches and their Story." H. H. Wrench.

FRIDAY, FEBRUARY 3.

R.P.S. Pictorial Group. Address. F. C. Tilney.
Walthamstow and Dist. P.S. "Passe Partout and Deep Framing." W. H. Jones and E. Willcocks.
[illegible] P.S. Y.P.U. Lantern Prints.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, January 24, Mr. E. W. Mellor in the chair.

Mr. C. M. Thomas, M.A., delivered a lantern lecture, "The Plate and the Photographer," a title (apparently not the lecturer's) which very inadequately described the subject of the discourse. Mr. Thomas talked of the physical and sensitometric properties which are possessed by a dry plate. The commendable aim of the paper was evidently to temper the strong wind of Hurter and Driffield to the shorn pictorial lambs. Yet he did not come to a downright declaration of this motive until he responded to the vote of thanks. Then, he envisaged photographers as divided into two camps, [illegible] on opposite sides of a chasm—the scientific people with their eyes fixed on gamma infinity, and the pictorialists bent on their [illegible] to the disregard of the scientific basis of the processes they used. Was there a bridge across the chasm? Yes, answered Mr. Thomas, in both camps the S-curve [illegible] for different [illegible].

It is impossible to report the substance of the lecture in the absence of the numerous diagrams and lantern [illegible]. Mr. Thomas started off by showing a simple form of density measuring instrument of his design and construction, suitable and sufficiently accurate for the measurement of negatives by the practical photographer. He proceeded to illustrate, alternately by curves and by negatives and transparencies therefrom, the properties of negatives [illegible] long and short range of densities. In like manner he sought to [illegible] side by side the diagrammatic and pictorial statements of the [illegible] and latitude of a plate, and passed in conclusion to some [illegible] illustrating the grain of an emulsion. A paper such as [illegible] should do much towards making results expressed in sensitometric language more accessible to those who regard curves and [illegible] as something incomprehensible. A hearty vote of thanks [illegible] accorded to the lecturer.

CROYDON CAMERA CLUB.

Mr. L. J. Hibbert—[illegible] "formed the crisp if [illegible] informa[illegible] for last week's meeting. It proved to relate [illegible] to [illegible] nor decimals, but to process blocks, the making [illegible] which was described in admirably clear [illegible]. Why they are [illegible] and how they are done, was also explained in [illegible].

[illegible]

[illegible] PHOTOGRAPHIC ASSOCIATION.

[illegible]

[illegible] members [illegible] the hope that [illegible] would be completed [illegible]

The Chairman [illegible] certain [illegible].

Mr. [illegible] seconded [illegible] that the present officers and [illegible] nominated for election [illegible] annual [illegible]

[illegible]

call themselves now an incorporated body but he had still to lodge the last form, and then the Registrar would issue a certificate. As soon as the last form was lodged they could get the authority to carry on business. He had still to get one or two signatures, and after these had been secured it would only be a question of a few days' delay. He would advise the Treasurer as soon as the formalities had been completed. In March the only business the old Association would have to do would be to pass a resolution to dissolve, but somebody had to have authority to call that meeting, therefore the old Association required its officers until then. The seal ought to be kept by the Secretary: it was usual to keep it in a box with two locks, two members of the Council keeping the keys. A minute book must be procured. The annual general meeting in March might be called for the same time and place as the first general meeting of the registered Association. All the notices could go out together.

The Secretary reported several cases in which members during the past month had sought advice and guidance. In one case where a member had, through the medium of the Association, recovered damages from a second-hand apparatus dealer, after deducting all out-of-pocket expenses, he had forwarded, with a covering letter of appreciation, the surplus cash as a donation to the funds of the P.P.A. (Applause.)

Before the Council rose the Chairman reported that three members of the Association had been returned winners of the 1st, 2nd and 3rd prizes in the Wellington and Ward Professional Portraiture Competition. Mr. Angus Basil (present), winner of the first prize, was heartily congratulated by his fellow-councillors. After a sitting of 3½ hours the Council adjourned.

Cambridge Photographic Club.—On Tuesday, January 17, Mr. T. H. B. Scott, president of the East Anglian Federation of Photographic Societies, who brought down the Federation Portfolio, gave an address on pictorial photography. By a fortunate chance Mr. Edward Peake, late of Norwich, who was really the founder of the Federation, was present, he having recently come to live in the neighbourhood of Cambridge. Mr. Scott gave an extremely interesting address. He has strong ideas of his own as to the relative importance of the rules of composition and "natural effect." He does not care anything about the "one-third from the top and one-third from the right-hand side business," so long as the picture shows the "something" that means individual thought and feeling. As an illustration of this Mr. Scott displayed one of his own pictures—one of a mean lane in Beccles, in which the ugliness of the buildings was lost in a beautiful effect of sunshine. He gave a brief sketch of the history of the East Anglian Federation. No other body or movement had done so much to raise the position of photography, said Mr. Scott. The movement was due to Mr. Peake, who suggested that the Federation should take for its motto that of the old Norwich School of Painters—"For Air and Space" Since the war there had been difficulty in getting things going again, but the speaker said he saw signs of a revival, and he appealed to the members of the Cambridge Club to help to carry on the good work.

Mr. Peake, in a short but impressive speech, strongly urged members to strive for natural effects. He concluded by saying that he would be proud to become a member of the club and to do all he could for it.

The Secretary, Mr. Wm. Farren, in proposing a vote of thanks to Mr. Scott, referred to the pleasure it gave to him and to the other old hands to have Mr. Peake with them, and to hear that there were signs of a revival of the East Anglian Federation. He also announced that Mr. Peake had consented to act as judge at the annual exhibition of the club, which is being held at the end of February.

The "Blackpool Times."—Messrs. Pictorial Machinery, Ltd., 7, Farringdon Road, London, E.C.1, inform us that the improved method of newspaper production adopted by the "Blackpool Times," and to which reference is made in a paragraph on another page of this issue, has been carried out in connection with their "Lithotex" plant, supplied to Messrs. Robertson, proprietors of the "Blackpool Times."

Commercial & Legal Intelligence.

Legal Notices.—Notice is given that a general meeting of the members of the United Service Studios, Limited, will be held on February 21, at 11 o'clock, at 13, Queen Street, Cheapside, E.C., for the purpose of considering the liquidator's report, showing the manner in which the winding-up has been conducted, and the property of the company disposed of.

Notice is given of the dissolution, by mutual consent, of the partnership between Jessie Emma Noon and Ernest Alfred Clark, carrying on business as picture frame makers, etc., at 20, St. Nicholas Street, Leicester. All debts due to and owing by the late firm will be received and paid by Ernest Alfred Clark.

NEW COMPANIES.

William Fox & Sons (Sheffield), Ltd.—This private company was registered on January 14, with a capital of £5,000 in £1 shares. Objects: to carry on the business of photographers and opticians, etc. The permanent directors are:—Mrs. M. Fox, The Grosvenor, West Cliff, Bournemouth; A. R. Fox (chairman), 15, Silver Hill Road, Sheffield. Qualification: £500. Remuneration: £300 each per annum. Secretary: A. R. Fox. Registered office: 8, Castle Street, Sheffield.

A. H. Development Syndicate, Ltd.—This private company was registered on January 16 with a capital of £100 in £1 shares. Objects: to carry on the business of engineers, manufacturers of all kinds of apparatus, whether mechanical, automatic, photographic or otherwise, etc. The first directors are:—E. S. Hunter, Ruben's Hotel; Buckingham Palace Road, S.W.; E. K. Hunter (permanent), 74, Primrose Mansions, Battersea Park, S.W.11 (directors of Hunters, Ltd.). Remuneration: £100 each per annum. Registered office: 16-18, St. Bride Street, E.C.

News and Notes.

Mr. Geo. J. Hughes, F.R.P.S., having disposed of his business known as Hughes & Co., Ltd., art photographers and photographic dealers, The Mall, Waterford, and Park Studio, Dungarvan, has now taken over the studio, Bridge-of-Allan, Stirlingshire, Scotland.

XL Printing Appliances.—Messrs. F. Brodrick, 50, High Street, London, W.C.2, have just issued an abridged price list of their chief appliances for printing, developing, fixing and washing of plates and films. One specialty is a printing box for the printing of amateurs' film spools. It is fitted with masking and self-numbering devices. Among other of these very workmanlike appliances is a teak cascade print washer of the pattern which we think is quite the best for the washing of large numbers of prints.

Royal Institution.—Among the evening and afternoon lectures to be delivered at the Royal Institution are "The Mount Everest Expedition," by Sir Francis Younghusband, on February 3; "Pigments and Mediums of the Old Masters," by Professor A. P. Laurie, on March 17. Dr. P. Chalmers Mitchell is to give two lectures on "The Cinema as a Zoological Method," on March 16 and 23, and among the art subjects Dr. E. A. Gardner will lecture on "Masterpieces of Greek Sculpture" and Mr. Arthur M. Hind on "Landscape Etchers, New and Old."

Hampshire House Photographic Society.—The annual exhibition of this Hammersmith Society will be held from April 21 to May 11. There will be three open classes for prints, monochrome slides and transparencies and colour transparencies. The judges are Messrs. Marcus Adams, Bertram Cox and Leonard Richmond, who will have at their disposal a number of certificates for work of outstanding merit. The last day for receipt of entries is March 30. Entry form and particulars from Mr. J. Ainger Hall, 26, Bishop's Mansions, Bishop's Park Road, S.W.6.

Photographs of Lincoln's "Imp."—A writer in one of the daily papers states that many of the photographs of the grotesque figure in the nave of Lincoln Cathedral, and known as the Imp, are

made from a model which at one time was kept by an enterprising verger. The real figure is in an awkward place for photographing, and on hearing the lamentations of photographers the verger procured a "life like" model which he, on request, hung at eye level in a convenient corner of the Cathedral. This, no doubt, was before the days of telephoto lenses.

THE FLORENCE BOOK FAIR.—In this exhibition, to be held at Florence from May to July next, photographic and cinematograph exhibits will be accepted in a special section. British exhibits at the Fair will be in the charge of an officer of the Board of Trade, whose expenses will be apportioned among the exhibitors. The Fair is being held in the rooms and gardens of the beautiful Pitti Palace. Particulars of charges for floor or wall space are obtainable from the British-Italian Commercial Association, agents in Great Britain for the British Chamber of Commerce for Italy, 12, Nicholas Lane, London, E.C.4.

SHOE-BUCKLE PORTRAITS.—A Montreal paper reports that Canadian "flappers" have discovered a sure way to bring the men to their feet. The new cue is to mount the picture of your "boy" on a colonial shoe buckle. Thus his subjugation is advertised to the world. When one is equally "keen" about two men the solution is simple. One has two feet. Assign each a buckle, awarding the favourite the right-foot position. When a new picture appears, the "flapper's" social set will invite the "original" as her escort. Thus an evening spent with a man she "just detests" is happily avoided.

ITALIAN OFFICIAL PHOTOGRAPHS.—Under the auspices of the National Propaganda Office, 4, Via Piatti, Milan, there has been instituted an "Italian Photographic Service for the Foreign Press." The object is to supply the principal illustrated journals of the world with photographs of current events in, and of the artistic and natural beauties of, Italy, and to illustrate the modern development of the country. It is hoped in this way not only to interest the Press and peoples of the world in Italy and her problems, but also to prevent and combat the traducing campaigns conducted at present through misleading or actually fraudulent photographs.

THE CAMERA AS A WITNESS.—The recent boxing match between Carpentier and Cook at the Albert Hall was well photographed, and some very fine prints from the negatives have been reproduced in the Press. The cinematograph film served to settle a disputed point, it being stated by some observers that a foul blow was struck. It was thought that Carpentier gave the knock-out blow when Cook was down, but a careful examination of the films by experts proves that the defeated boxer's knees had not touched the floor—though they were rapidly approaching it—at the time it was struck. Thus the camera repudiates the unfounded suggestion of a foul, and most of the critics are quite satisfied that the finish of the fight was a perfectly fair one.

AT THE HALCYON CLUB in Cork Street there is a small exhibition of photographs and artistic objects which may be classed as modern minor arts. The greater number of the photographs are by Miss Agnes B. Warburg, whose work here shows to great advantage. It is straightforward and technically sound. Perhaps the best picture of the whole is "The Tolsey, Burford," the tone values of which are so true as to secure it life and luminosity. In "Conway Castle" Miss Warburg avoids the usual danger of making a silhouette effect at the expense of interest and definition in the dark object. The exhibition closes on the 30th instant. We were invited, but we presume any visitor would be welcome who could pass the Cerberus at the door.

KODURA ETCHING BROWN ENLARGEMENTS.—Messrs. Marshall & Co., Mansfield Road, Nottingham, a firm of enlargers and trade workers maintaining a standard of distinctive quality, send us an example of a new style of enlargement which they are now offering to supply. This new special line is an enlargement on Kodak "Etching Brown" Kodura paper, 9½ x 7½ inches in size and presented in a folder mount of most agreeable buff tint, with tissue covering for the print. Outside dimensions of the folder are 14 x 10 inches. The photograph is of fine quality, and would certainly be taken for a direct print. In the size just mentioned, Messrs. Marshall supply at the price of 4s., or in whole-plate at 3s. 6d. It is quite a welcome and most artistic addition to the styles of enlargement which photographers may obtain from the trade houses.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.—We are glad to notice that our Birmingham friends are getting into their stride again and are holding the first open exhibition since the outbreak of war. It will be the 31st, will be held at the galleries of the Royal Birmingham Society of Artists, New Street, and will, no doubt, rank in importance with the exhibitions of former years. The selection committee consists of Messrs. Harold Baker, J. C. Batkin, W. A. Clark, Harold Holcroft, Bernard Moore and J. W. Moore. Mr. F. J. Mortimer will judge the pictorial classes; Mr. R. Hancock those of scientific and technical exhibits, and Mr. A. J. Leeson the survey exhibits. Medals and certificates are at the disposal of the judge in each class. The prospectus has now been published and is obtainable from Mr. Philip Docker, Birmingham Medical Institute, Edmund Street, Birmingham. The last date for the receipt of exhibits is February 25. Entry forms require to be received by February 15.

THE ACME ART ASSOCIATION.—It is not often, we imagine, that a firm receives an order for nearly 40 ivory miniatures of members of a single group of families. On hearing from the Acme Art Association that they had recently executed such a commission, we gladly accepted the firm's invitation to look at the collection at its studios at 342, Camden Road, London, N.7. We were pleased and interested in examining the work, which has been done by the firm's own artists, and reflects the greatest credit upon them, not only as regards the technique of the art of miniature painting, but also in respect to what is often a more important matter, namely, the preservation of the likeness. We would not wish to have miniatures which are more acceptable in respect to these two qualities than those which have been made in the present instance by the Acme Art Association. After all, the perfection of the work is only what is to be expected from a firm which, for more than twenty years, has specialised in miniature painting, with and without photographic basis, on ivory and ivorine. We congratulate the company on this most practical form of tribute to its reputation. It may perhaps prevent any misapprehension which this reference to the firm's work may create, if we add, for the information of those who have not had transactions with it, that the Acme Art Association undertakes the making of coloured portraits in all the customary media—water colours, pastel and oils—both freehand and on a photographic basis. Its work in these various branches is distinguished by a refined sense of colouring, and evidently also by a lively recognition of photographers' requirements. In making a little tour of the studios, we saw work in hand for a number of photographers whose names are household words—it would not do to say what they are—so that we are in the happy position of feeling that our appreciation of the work of the Acme Art Association is shared by leading photographic portraitists.

Correspondence.

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

*** *No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

BEACH PHOTOGRAPHY.

To the Editors.

Gentlemen,—In answer to a correspondent on page 44, January 20, of the "B.J." you reply "that the local authority has power to prevent anyone from taking photographs."

I know that beach inspectors do order camera users away, and I should be glad to know if any of your readers have successfully contested the rights of local authorities to make such prohibitions.

Are the local foreshore by-laws countersigned by the Home Secretary, or how are they made legal? I am not concerned with the man who runs a dark room on the beach, but one who has a shop in the town, and sends operators with hand cameras.—Yours faithfully,

ONE HUNDRED AND ONE.

THE P.P.A. CONGRESS.

To the Editors.

Gentlemen,—I have been a member of the P.P.A. practically since its inception, and feel bound to express my strong disapproval of the action of the Council in moving the date of the Congress from May to September, thereby depriving many Scottish photographers of the opportunity of visiting both shows.

There are not many of us who, in these depressed times, find it convenient to make a double journey from the North. Possibly the Council do not think it worth while considering the Scottish members, as they are not usually largely represented, but it would be interesting to know how the President (a Scotsman) looked on the matter, and what his views, if expressed, were.

I have heard it whispered that one of the principal reasons for the change is because it is not convenient for Americans and other photographic dignitaries to attend in the spring. If it is the attitude of the Council to give preference to these shining lights from overseas, I am not surprised to hear of the big falling off in membership.

I have not yet received the form of application for membership of the P.P.A. of Great Britain and Ireland, Ltd., to which "An Old Member" humorously refers, but I beg to suggest, sirs, that unless the policy of the new company harmonises better with the interests of country members, the new company will not only be Ltd., but also, I venture to think, "Very Limited."

Personally, I shall attend the Fair, and hope to travel South on April 30 with my wife, but to say we are disappointed is to put it mildly—Yours faithfully,

SCOTTIE.

COLOUR PHOTOGRAPHS OF STAGE PLAYS.

To the Editors.

Gentlemen,—With reference to the letter from Mr. T. J. Offer in your issue of the 13th inst., photographs in colour of stage plays were taken several years ago by the late Dr. E. F. Grün, of Southwick, near Brighton. He used the special lens of his own design, working at an aperture of f/1.5, and a good many of his experiments were made at the Brighton Theatre Royal. Some of the results were quite good. Dr. Grün and Mr. Jumeaux worked together in colour photography, and I believe had a process of their own.—Yours truly,

A. H. C. CORDER.

36, Mount Zion Place, Brighton.
January 21.

INVENTIONS IN COLOUR PHOTOGRAPHY.

To the Editors.

Gentlemen,—I am sure that Mr. Butler, whose letter appears on page 771 of the "B.J." of December 23, 1921, acted in good faith when he applied for a patent on my "Kromskop" optical system with plate-holders attached; but a sufficient answer to his statement that "it was neither designed for nor capable of taking tricolour negatives" is found in the fact that the title of my U.S. patent for the invention (issued December 18, '94, No. 531,040) was "Photochromoscope and Photochromoscope Camera," and that in previous patents and publications I had pointed out that optical systems calculated to blend the images to the eye would also serve to make the original photographs. My original one-plate photochromoscope was described in the "Handbook to the Photochromoscope" (London, 1894) only as a viewing instrument, but in the U.S. patent it was described as a "camera" which could also be used as a viewing instrument.

Much has been made of the fact that my patent drawings showed no plate-holders attached, but that was true of half-a-dozen cameras which I patented, the Patent Office not requiring that they be shown in the drawings because the method of constructing and attaching plate-holders was "well known in the art," and I claimed no invention therein. B. J. Edwards was another who applied for a patent for the system with plate-holders attached, and the Comptroller of Patents, on my protest, refused to grant the patent, declaring that the invention was mine.

This type of camera does not give three perfectly registering images if the reflectors are plane-parallel. I patented three methods of eliminating this defect, and disclosed two others without patenting them—all perfectly efficient, though not equally desirable for adoption in the commercial manufacture of trichromatic cameras. Incidentally, I may say that I patented nine different types of single-exposure trichromatic cameras, all of which operated satisfactorily. Making trichromatic cameras "register" is one of the simplest "problems" I have had occasion to attack. The most difficult problem was to find a way to make them simple enough and cheap enough to popularise trichromatic colour photography. My "Tripak" and "Hiblock" systems came nearer than anything else to meeting this requirement, but met with insufficient appreciation and encouragement to sustain the Corporation which undertook to exploit them. I have no doubt that a less ambitious effort, not involving the overhead cost of elaborate office equipment and business system would, with wise management, meet with modest and increasing success, but there appears to be no very substantial interest in the subject up to the present time.—Very truly yours,

F. E. IVES.

1,327, Spruce Street, Philadelphia, January 7.

SHARPENING RETOUCHING PENCILS.

To the Editors.

Gentlemen,—In the article on "Retouching Materials" in this week's "B.J." the writer describes two methods of sharpening pencils on glasspaper. A good many years ago I spent several years in a Clyde shipyard, and in the drawing office, where some of the finest detail mechanical drawing which I have ever seen was turned out. We all used files for sharpening our pencils to a chisel point, and this is almost the invariable practice on the Clyde.

Though I have no claim to be an expert retoucher, I invariably use a file to sharpen the pencil. It is clean and quick, and I have never found any difficulty in avoiding breakages. If an extraordinarily smooth finish to the lead is required this may be obtained by very lightly finishing on a piece of ground glass. So many text books recommend glasspaper that the use of a file, which is often preferred, does not appear to be widely known.—Yours faithfully,

A. H. HALL.

1, Eliot Vale, Blackheath, S.E.3.
January 22.

TRIMMING AND MOUNTING STEREOGRAMS.

To the Editors.

Gentlemen,—The curious ignorance that prevails about the preparation of stereograms was recently illustrated in a remarkable manner to the writer, when a professional photographer actually expressed his astonishment at being informed that after trimming the prints require transposing. He not only confessed that he was entirely ignorant of this well-known fact, but stated that he had printed and mounted dozens of stereograms for customers, without ever transposing, nor had he ever had a complaint. In view of the fact that the results must have been preposterously pseudoscopic, the circumstance shows that not only this photographer, but many of his customers, must have failed altogether to realise what the stereoscopic effect is really like. The reason for the need of transposition sometimes puzzles beginners, but if they would only bear in mind that the two images are, each of them, inverted in the camera, they would realise that when the double print is turned from this upside-down position, the view that belonged to the right-hand lens will necessarily be brought over to the left-hand, and that which belonged to the left lens will be on the right, so that the two must be transposed to get them to their proper positions.

A second frequent fault in stereograms is that the pairs are so often placed too widely apart. This occurs in the endeavour to get as much in the picture as possible. They are very commonly cut to a width of 3 inches. Leaving, say, a quarter of an inch between them in the middle, this means an actual separation of $3\frac{1}{4}$ inches. To the practised eye it may not be difficult to combine such pairs in the stereoscope, but to many people it is a severe strain to do so, and some little time has to elapse before they can make the two views blend into one.

The ideal limits for perfectly easy combination are a maximum of $2\frac{3}{4}$ inches between the farthest distance points in the pairs and a minimum of $2\frac{1}{2}$ inches between corresponding points in the nearest foreground of the scene. By keeping within these limits a stereogram

...y be ensured that will immediately give full relief effect in the ...oscope to any normal pair of eyes. The separation must, of ..., take into account any central margin space that may be left ...tween the pairs on mounting.

A third essential in trimming an ideal stereogram is that the ...-hand picture should include a little more of the portion to the ...me right in the view, and conversely that the right-hand pic... should include a little more of the portion to the extreme left. ...is condition secures a view in the stereoscope that is behind the ... of the card. On the other hand, if an extended view to the ... is allowed in the left-hand picture, and to the right in the ...-hand picture, the combined view will appear in front of the ..., giving an unnatural effect. The reason is clear: If we look ... a scene through an open window, using each eye successively, we ... see with the left eye further to the right, and with the right ... further to the left. Hence, by reproducing that arrangement in ...ming stereoscopic pairs we get the effect of seeing the com... view as through a frame or window, which is pictorially ...factory.

There are, of course, other essential points in trimming and mount... stereograms to the best advantage, such, for example, as ensur... that corresponding points are perfectly in line, that the two ... are equally printed and smoothly mounted and so forth, but ... elementary desiderata make their own appeal to common... and scarcely call for special allusion even to a tyro.—Yours ...fully,

C. E. B.

THE INCOMPETENCE OF THE AVERAGE PHOTOGRAPHIC ASSISTANT.

To the Editors.

Gentlemen,—It is perfectly amazing how little the average person ...o applies for a post knows about the job he or she is applying ... For quite a long time I have been looking for a really com... ...inisher (lady) in monochrome, and I have interviewed and ... specimens of work from dozens, and I cannot find one—at any ...ice. It is the same in other departments; there must be some... ...extraordinarily wrong in the present methods of training. This letter is prompted by my having just turned away the ...eenth applicant—an ordinarily intelligent and educated girl ... has just finished a "three years' apprenticeship" with a high... West-end studio—for the munificent salary of 15s. a week! ... what has she learnt? "A little about everything." Yes, very ... But anything sufficiently well to be of any future use or to ... her another job at the present time? I doubt it.

The L.C.C. Trades School at Queen Square has turned out some ...llent assistants. But this, the only satisfactory source I know ..., is at present dried up apparently.

Is this not a subject which the P.P.A. ought to firmly take in ... and try to emulate the efficiency of our American friends, who ... so thoroughly look after and properly train their assistants!—... truly,

BELGRAVIA.

THE FIRST TEXT-BOOK OF BROMIDE PRINTING.

To the Editors.

Gentlemen,—When visiting the South Suburban Photographic ...ety recently, a club to which many Blackheath and Greenwich ...bers belong, my friends there fell to talking of the part men of ... district had played in the history of photography, of the early ...facture of bromide paper in the suburb, and of Mr. W. T. ...gan, the local professional—still well-remembered by some—who ... so much towards making bromide paper a commercial success, ... local firm becoming in later years Morgan & Kidd, with works ..., Surrey.

...mide paper of a sort was advertised by a Liverpool firm as ... as 1874, the advertisement appearing in the "B.J. Almanac" ... year, but it did not catch on, in spite of the efforts of Mr. ... Mawdsley to popularise it. Harrison's "History of Photo... ..." states that: "In 1880 Messrs. W. T. Morgan & Co., of ...wich, commenced the manufacture on a large scale, and in a ...phlet written for the firm by John Burgess and published in ..., 1880, it is stated that such paper had been made by them since ..." Harrison also tells us that Morgan's paper was "to be used ...printing by development, after the manner suggested by Abney in the same year (1880)," and this method is given on pages 103 and 160 of the 1880 volume of the "B.J."

Knowing of my collection of old photographic books, I was asked about Morgan's booklet, which was understood to be most rare, and I was sorry to confess that I did not possess it—had, in fact, never seen it. But to-day I have it, thanks to the kindness of a gentleman who knew the writer of it, and who actually printed it.

The booklet, paper covered, and of 6½ x 5 plate size, contains in its 56 pages much that is of interest; it is written in a breezy "take-you-by-the-hand style," and its price was half-a-crown, a sample bromide print being included as a frontispiece.

The title page is not the least interesting of the book's varied contents, for it reads as follows: "The Argentic Gelatino-Bromide Workers' Guide, or How to Produce Perfect Sparkling Negatives in the Shortest Time, with the Least Trouble and the Greatest Certainty: with Instructions for Using the New Argentic Bromide Paper for Rapid Positive Printing; also How to Make Transparencies; Magic Lantern Slides; Ivorytypes (or the Eburneum Process); Enlargements on Opal, Paper and Canvas; besides many Wrinkles of an Old Practitioner, by John Burgess, the Originator of Washed Gelatino-Bromide Emulsion, Pellicle, Dry Plate, etc. Illustrated by Specimens of Instantaneous Photography. Produced by W. T. Morgan & Co.'s New Argentic Gelatino-Bromide Plates and New Method of Development. Published by W. T. Morgan & Co., Hello House, The Circus, Greenwich, S.E. Printed by H. S. Richardson, Greenwich."

In his "Introduction," Mr. Burgess writes: "It is now seven years since I introduced an entirely new process for dry plates. ... and I ventured then to predict that the advantages offered by the new process were so numerous and so great that eventually it must supersede the bath and collodion. My expectations are now in a fair way of being realised." After enlarging upon the advantages of the dry plate, he continues: "It is a great satisfaction to me to announce that in the early days of argentic-gelatino bromide I found a sympathising worker in Mr. W. T. Morgan, of Greenwich, a practical and skilful photographer, doing a high-class trade, and with whom I am now commercially associated—to him, and his manager, Mr. R. L. Kidd, I am indebted for many valuable hints, which immensely enhance the utility of this little book."

The worker is told how to make his own darkroom light by covering the window with two thicknesses of orange-coloured paper, made by staining yellow paper in spirit 4 ozs., aurine 1 oz., and afterwards rubbing it over with boiled oil. After this the reader is told that he can get suitable material for covering a window from a dealer, and that "perhaps the safest way will be to get it there." Pyro-ammonia is recommended as a developer for the plates, and vertical baths and dippers, "some use dishes, but the baths are more convenient." Ferrous oxalate, "a comparatively new developer," is also described, and the instructions for developing the negative are most elaborate.

The booklet is naturally very strong on the advantages of the firm's specialty—bromide paper, which "is destined to play an important part in the production of the positive picture, and to extend the photographer's business to much wider fields of enterprise than have yet been opened to him. He need not be in future the minister of vanity, but may aspire to a much more important place as a promoter of trade and commerce, of art and science. ... A better time has come for our profession, all who are wise will be ready for the flood tide and float joyously on to fortune. The bickering doubters will halt and hesitate till the opportunity has passed, and go puddling all their lives in shallows. Let every photographer learn to make the most of gelatino-bromide, and his lot will be a happier one than of old."

This, and very much more of it written in a similar strain, forms interesting reading to-day when bromide paper is so widely used. The remarks are also of great historical interest for, if I am not mistaken, the booklet was one of the first—if not actually the first—to be written on the advantages and working of bromide paper.

L. TENNANT WOODS.

[Our correspondent tells us that he has ascertained from his informant that the date of publication of the book was 1880. Historically the date is of some importance, as it establishes that of the commercial manufacture of bromide paper by Messrs. Morgan & Kidd. The R.P.S. catalogue queries it as 1890, which is obviously ten years later than the true date.—EDS., B.J.]

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

W. H. S.—For all-round outdoor work, with a half-plate camera, we think 9 inches is the best focal length.

M. W.—The photograph has been eaten by insects in places. This is a more common experience than, perhaps, many people imagine. Spiders will cause this kind of damage to prints, and so will other insects to be found in a house.

H. B.—Providing reasonable care is taken in the manipulation—that is to say, the inscriptions not rubbed—the ordinary waterproof Indian ink, as sold by artists' dealers, and as made by Messrs. Charles M. Higgins and Co., 11, Farringdon Avenue, London, E.C.4, is very suitable for your purpose.

W. S. E.—The photograph evidently suffers from reflection by the semi-mirror like surface of the tablet. Although it may make the light very much weaker, we are afraid the only way to get rid of this is to back up the camera with a big screen of dark material of such size, that when you put your eye as nearly as you can in the position of the lens you cannot see reflections from the tablet. It may be a question of giving several hours' exposure, but we know of no other way of overcoming the difficulty. A panchromatic plate used through a K2 light-filter might be of advantage, but not sufficiently so as to obviate the necessity of erecting a screen behind the camera.

A S.—We do not think that you will do better than to fit four 1,000-c.p. are lamps in the positions indicated by red crosses on your plan (returned). A fifth might be added in case you want to make larger groups. The lamps should be 8 ft. from the floor for standing figures, but should lower to 6 ft. or even less for sitting poses and children. You will note that we have chosen the other side of your studio, as not only will the lamps not interfere with the daylight, but nine sitters out of ten are better looking when the left cheek is turned to the camera. Each lamp should have a thin calico or close muslin diffuser in front and a white reflector behind.

W. H.—The method of ascertaining the effective diameter is as follows:—The lens is fitted to the camera and focussed on a very distant object. For a 10-inch lens the object should be at any rate a mile away. Then, without altering the adjustment of the camera in the slightest, the focussing screen is replaced by a piece of cardboard with a pinhole in the middle of it, and, in the dark room, a small piece of bromide paper is placed in the cap of the lens, and the cap then put on, the bromide paper, of course, facing the lens. If now with the full aperture you burn an inch or so of magnesium ribbon immediately behind the pinhole, you will get a black disc on developing the bromide paper. The diameter of this disc is the effective diameter of the lens, that is, by dividing this diameter into the focal length you get the actual F. No.

H. B.—(1) Most of the cheap enlargement firms use a good, solid pattern of square bellows camera, fitted with a fairly rapid lens, which may be even a portrait lens, or at any rate has an aperture not smaller than about *f*/5.6. (2) This copying work is very commonly done on 3½ by 2½ plates, or in about this size, making several exposures on a larger plate by means of one of the repeating backs, such as the "Multisecto," or similar appliance of Messrs. Jonathan Fallowfield, 146, Charing Cross Road, London, W.C.2. (3) It is usual to copy down to 3½ by 2½, or to copy-enlarge direct to this size when working from very small originals. (4) No book on the subject. (5) When reducing, the best plate is one of the rather slow landscape type, or even one of the special "fine grain," such as almost every maker now supplies for copying. These plates are rather slow when copying-enlarging, and in order to keep exposures reasonably short we think you would have to use a faster plate. (6) For the large degree of enlargement, which will be necessary, the negative should be quite thin and soft.

E. S. M.—(1 and 2) We think there is little to choose between a high-power half-watt of, say, 1,000 c.p. and a number of smaller ones amounting to about the same power. In either case, for good diffusion, you would want one thickness of opal glass, although if you use a number of smaller lamps, say, five or six of about 200 c.p., you could very likely obtain sufficient diffusion with ground glass. We think the gas-filled lamps are the better, certainly if the light box is going to be moved up and down, on account of their greater strength, and also because in most patterns the filament is horizontal, whereas with ordinary vacuum lamps the filament usually runs in the worst position for your purpose, namely, vertically. (4) So long as the inside of the lamp house has a matt white coating it does not matter very much what shape it is. Certainly a dome roof would be somewhat better. The chief difficulty in this system of illuminating a negative is ample ventilation of the lamp-house. You want to have it as big as you conveniently can, and make the fullest provision for entry of air below and exit from the upper portion.

P. L.—It is hopeless to attempt a job of this sort if the shop-front itself is in shadow and the opposite side of the road strongly lighted. The conditions require to be reversed, and even then it is often no easy matter to avoid patches of reflection in the window, which look unsightly and effectually hide, in the photograph, the goods which are displayed. Sometimes in undertaking such a job it is worth while to erect a screen of dark material behind the camera so as to cut out opposing buildings. In a busy thoroughfare this can only be done in the very early morning, and often then only by using quite a small stop in the lens in conjunction with a slow plate, and so giving an exposure which is long enough to prevent the passage of people along the pavement from having any effect on the plate. Some prefer for this purpose to use an ordinary slow plate behind a colour filter simply for the purpose of running the exposure into minutes. Where no screen is possible, reflections can sometimes be dodged, even when taking a front view, by placing the camera pointing straight towards the shop front, but a little to the right or left, and making use of ample cross-front movement on a square-bellows camera. This calls for a lens of ample covering power. If the contents of a window are thoroughly well lighted by concealed lamps, as is done now by many expert window-dressers, such jobs can be very successfully tackled at night. A colour-sensitive plate and a long exposure are called for, and, for securing the facia and outside of the shop building, a supplementary lighting from a couple of magnesium torches (each of four or five strands of magnesium ribbon) requires to be used. Sometimes it is possible to arrange to use daylight for the supplementary lighting by doing the work in the very early hours of the morning, and, without moving the camera, waiting for daybreak as a means of illuminating the outside of the building. There is no book on general outdoor work; the little manual, "Commercial Photography," price 1s. 3d., post free from our publishers, deals with some branches

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3222. Vol. LXIX. FRIDAY, FEBRUARY 3, 1922. Price Fourpence.

Contents.

SUMMARY.

Mr. Louis Nell describes the making of a vertical pattern of enlarger for use with incandescent gas, and shows, with the aid of several illustrations, how a useful appliance of this kind can be readily constructed at small expense. (P. 63.)

In a leading article some practical hints are given on the making of carbon prints upon rigid supports, such as ivory or ivorine, wood, metal or glass. (P. 62.)

The Rev. H. O. Browne, following an exposition of the general principles of stereoscopic photographic and viewing, proceeds to the formulation of definite rules for the print width of stereoscopic pairs. (P. 64.)

The Lancashire Society of Master Photographers is arranging an interchange series of lighting and posing demonstrations at members' studios, and has taken the step of allowing a member to nominate an assistant as an affiliated member in order that employees in charge of studio work shall share in the benefits of the demonstrations. (P. 68.)

A remarkable optical recommendation in connection with photographic portraiture was recently passed off by a daily newspaper, obviously by an error of ignorance, as the opinion of an expert a portraitist as Mr. C. P. Crowther. (P. 61.)

Correspondence appears on the pros and cons of the September Congress of the P.P.A., and on the causes of inefficiency of photographic assistants. (P. 70.)

At the Croydon Camera Club, Mr. H. P. C. Harper gave the pyro formula used by him in the development of lantern slides. (P. 68.)

The remedy of a farmer's wife for burns from flashlight and a cure for metol poisoning are communicated by a correspondent. (Pp. 69-70.)

An optical device for the photography of the living eye is the subject of a recent patent specification. (P. 66.)

"COLOUR PHOTOGRAPHY" SUPPLEMENT.

In a contributed article Mr. R. M. Fanstone describes and illustrates a pattern of plate-holder specially suitable for exposure of Paget colour screen-plates in the way of producing firm and even contact between the taking screen and the emulsion surface. (P. 5.)

We give working details of the method of three-colour printing worked out by Mr. J. F. Shepherd, and named "Triadochrome" by him. (P. 8.)

The first drama cinema colour film to be produced by photographic processes has been exhibited as "The Glorious Adventure." The film is by the Prizma process. (P. 8.)

A process of producing colour cinema films, which has recently been patented, is based upon the taking of larger and smaller negatives, positives from which are afterwards combined in the colour film. (P. 6.)

A method of making three-colour prints, devised by Mr. John Lewisohn, of New York, is based on special treatment of a ferro-prussiate print. (P. 7.)

EX CATHEDRA.

Press Photographs. There is a certain significance in the recent announcements that official organisations in France and in Italy are undertaking a photographic news service, and are placing such photographs at the disposal of journalists and newspapers, having need of illustrated matter dealing with these countries. Such a course would hardly be taken if Press photography at the present time maintained a reasonably high standard of accuracy—a standard as high, say, as that applying to the news in the papers. But anybody who turns over the pages of the daily illustrated newspapers and the "news photograph" sections of the ordinary daily Press, realises how far Press photography has fallen below its original mission of reporting the news of the day in photographic pictures. At the present time it is scarcely an exaggeration to say that one-half of the photographs reproduced in the newspapers are not news at all, but manufactured studies or photographs of incidents or people so insignificant as not to be worth the cost of plates, blocks and paper which their publication represents. One has only to think of the difference between the picture dailies now and the "Daily Graphic" of the period before its recent transformation, when it was a legitimate picture newspaper, in order to realise the regrettable change which has taken place. We are not reflecting upon Press photographers who, perforce, must supply what publishers and editors want, but it is futile to shut our eyes to the fact that photographic illustration of the popular Press has fallen to a very low level, and now is a purveyor of genuine news only to a fractional degree.

* * *

Intimacy. We know Mr. C. P. Crowther to be a most accomplished portrait photographer and also the possessor of an inexhaustible flow of engaging talk. The latter is an asset which has its dangers. An example of them is contained in what professes to be the report of an interview with Mr. Crowther published last week in a daily newspaper. It appears that "intimacy" was the subject of conversation. "Intimate photography," Mr. Crowther is represented as having said, "is the most interesting thing at the moment," but all we can learn of this interesting development is that the "intimate" photographer, instead of asking his subject to sit some distance away from the camera, places the latter right up against the sitter's face. This recommendation is given the emphasis of a headline, and it is further stated that "as experimental knowledge of the use of the lens develops in this direction we shall be able to make the camera record as nearly as possible what is seen by the eye." We suggest, on the other hand, that as experimental knowledge of the use of the lens, on the part of the newspaper reporter, develops, it will be ascertained that a lens possesses a focal length. We have no doubt that Mr. Crowther did

say something to his interviewer which optically was not downright nonsense. When the subject passed into questions of psychology, the reporter seems to have been on surer ground. He tells us that when Mr. Crowther is photographing a man, he says, "just talk into the camera to the prettiest woman you know," and the result is good. There we have something which sounds more like a genuine Crowther formula.

* * *

Associate Assistants. We welcome, as an altogether wise and prudent proposition, the move which is announced on the part of the Society of Master Photographers, namely, the admission of (selected) assistants as associate members of the Society. As a report on another column shows, this broadening of the Society's scope has been prompted by a desire for assistants to be present at the interchange demonstrations which are now being arranged among members of the Society. It is a step forward, calculated to benefit all concerned. Are we to assume that what Lancashire thinks to-day will be the programme of similar associations in the near future?

CARBON PRINTING UPON RIGID SUPPORTS.

Apart from the well-known qualities of the carbon process, absolute permanence and variety of colour, there is another very important one which is generally overlooked, and this is its adaptability for producing images upon surfaces which, by reason of their liability to stain or corrode, cannot be coated with the usual solutions or emulsions used upon glass or paper.

The most generally needed application of the carbon process to any other support than paper is in the production of a "photographic basis" to an ivory miniature, but prints upon other supports are sometimes needed, such as miniature reproductions of memorial tablets upon brass, copper, or even marble plaques or medallions or panels of wood for decorative purposes.

This branch of carbon work presents no greater difficulties than the ordinary double transfer process upon paper, and as the prints required are usually very small in size, a first attempt in carbon printing may well take the form of a miniature upon genuine ivory or ivorine.

As full details of the procedure in carbon printing are to be found in every photographic manual, there is no necessity to recapitulate them here, but there are a few points to which attention may be drawn in order to prevent discouraging failures. In the first place, the tissue used should be quite freshly sensitised, in order that there may be no trace of "tint," and that it may be developed at a fairly low temperature to preclude the possibility of sticking to a properly-waxed temporary support. It is desirable, if the tissue be bought in a sensitive condition, that it be used within two or three days of its receipt. Sensitising is, however, such a simple matter, that it is better to do it at home and be independent of the post. All that is required is a five per cent. solution of bichromate of potash, to which a few drops of ammonia have been added, and one or two ferrotype plates with good surfaces, which have been rubbed with a rag moistened with petroleum and then polished until all greasiness has disappeared. After immersion in the sensitiser for from one to three minutes, according to temperature, the tissue is gently, but firmly, squeegeed upon the ferrotype and set aside to dry, care being taken that no very strong light falls upon the back. In a warm room drying will be complete in about three hours and the tissue will come away with a perfectly flat and even surface, free from streaks and unaffected by any gas or coke fumes which may have been present in the room, because the surface has been protected by the ferrotype plate as long as it was moist enough to be injured.

Prints to be transferred to ivory should be very delicate in character; hence, over-printing must be avoided. It is a good plan to print rather lightly and to commence development with water at a temperature of 80 degs. Fahr. This is to avoid washing away the more delicate half-tones. When developed, the prints should be alumed, rinsed and hung up to dry, while the ivory is being prepared for their reception.

In order to secure adherence of the carbon image to the ivory the surface of the latter must be coated with a thin film of insoluble gelatine, which is made and applied as follows:—Half an ounce of gelatine is soaked in water until well swelled, the water is poured off and eight ounces of hot water poured on. This will dissolve the gelatine; to this add 10 grains of chrome alum dissolved in two ounces of hot water, stirring or shaking well meanwhile. This solution should be poured over the ivory as in varnishing a negative, or the ivory may be immersed so that both sides are coated. The ivory is then set on edge, away from dust, until quite dry. When the coating is quite hard, the remainder of the gelatine solution should be poured into a warm dish and brought into a quite thin condition over a gas ring or stove; the print on its flexible support is immersed until limp, and then the ivory is slipped in beneath it and the two lifted out together, brought into contact by a couple of strokes with a squeegee and set aside to dry. When dry, if the paper does not fall off, a gentle pull will detach it, and the carbon will be left firmly attached to the ivory. The picture may now be handed to the artist, who will probably prepare it for colouring by rubbing the surface down with pumice powder until the image is faint enough for his purpose. If it is to be tinted only after the fashion of a paper print, the rubbing down may be omitted.

It will be noted that when purchased one side of the ivory is evenly ground, and the other usually shows lines or saw marks. It is advisable to mark the latter with a pencil cross in one corner, to avoid mistakes in coating and transferring, as it is not easy to distinguish the sides when they are wet.

Ivorine or celluloid is frequently used as a substitute for the more expensive ivory for cheap work; it is treated in exactly the same way as described for ivory. Brass or silver plates must be freshly polished and quite free from grease. A final polish with alcohol and whiting will ensure this, but care must be taken that all traces of whiting are removed from the back and edges, or they may get mixed with the substratum. Wood should have the grain filled with a good varnish, such as white copal, which, when hard, is rubbed down with pumice powder and water before coating with the substratum.

Prints may be developed upon ground opal glass without other preparation, or they may be transferred as already described. If they are to be coloured it will be found advantageous to use the gelatine substratum, as this gives a continuous coating over the high-lights, making it easier to get an even wash than upon the raw surface of the opal. Glass must be coated with the gelatine substratum, or there is danger of the film scaling off. Bichromated gelatine is often used for clear glass, but the chrome-alum solution is equally effective.

In case a failure has been made in transferring, the print should be soaked in water until soft, and then as much as possible removed with a stiff nail brush; a little damp pumice powder applied with the finger will remove any remaining traces of the coating and leave the support ready to start *de novo*.

A HOME-MADE VERTICAL ENLARGER FOR INCANDESCENT GAS.

Of recent years much attention has been devoted to the vertical form of enlarger, but with one exception all patterns that I have seen were fitted for electric light. These notes may interest photographers with no electric light and but little space at their disposal and who can afford only a moderate outlay.

The apparatus illustrated is the outcome of a suggestion I made several years ago to a friend whose mastery of tools is that of a skilled cabinet maker. The original model gave good results, but practical work entailed the gradual addition of many improvements, so that the apparatus now leaves little to be desired.

There is a light-box, *a*; a removable box, *b*, for condenser and negative carrier; a camera-fitting, *c*, to which I can instantly attach an old camera, 16; an easel, *d*, and two uprights, *e*, to which the light-box is screwed, and on which the easel slides.

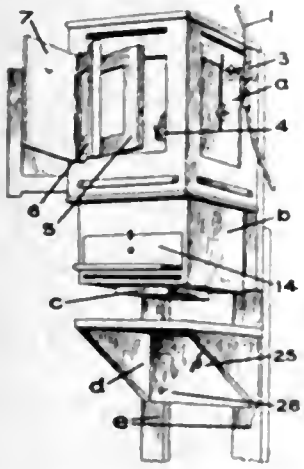


Fig. 1.—Light-fittings, hinged front windows and reflector, and easel raised when not in use.

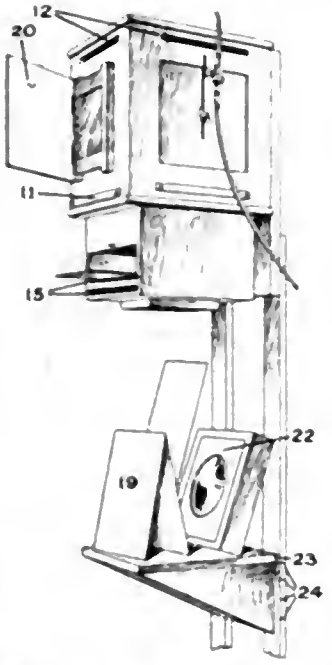


Fig. 2.—Condenser drawer, ventilation slots, paper-holder, and registering indicator for easel.

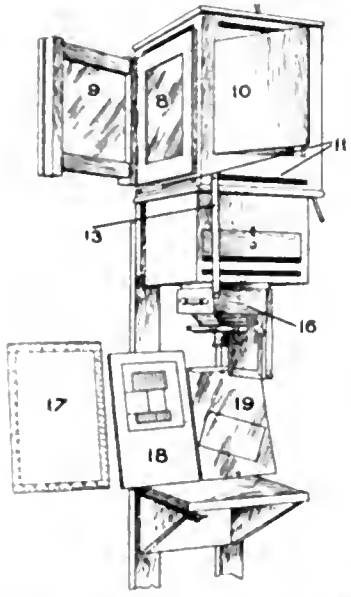


Fig. 3.—Slot for plain or ground glass, negative carrier (with inner carrier for stereo negative 45 x 107 mm.), postcard in paper-holder, and scaled composing card.

The asbestos-lined light-box has a fitting, 3, for a central bijou inverted mantle, 4; this fitting slides vertically, and can be clamped at any point. A length of metal tubing, 1, connects with the ordinary gas bracket. The front has a hinged door, 5, with a yellow safe-light. An outer frame, 6, hinged to this door carries a red safe-light. There is also a hinged white reflector, 7 and 10, throwing the light on to the developing stance. A screw-eye, 20, on the reflector enables a watch to be hung in the light (yellow or red), the seconds hand being quite visible from a distance. On the side of the box opposite the burner fitting there is a large yellow window, 8, with a hinged outer red safe-light, 9. Instant change of colour is therefore a feature. Green can be substituted for red in a few moments. Ventilation slots of ample size (11, 12 and others not shown) prevent heating. The lower front opening is not permanently trapped, there being a cover (13, shown open) permitting the easy insertion or removal of a sheet of plain or ground glass (I grind mine with knife powder). This glass catches droppings from the mantle and—in conjunction with the inflow of cold air just above it—ensures a cool condenser. The condenser keeps cucumber cool; it cannot crack and does not dew. The 5-in. condenser lenses are fitted in a drawer, 14 and 22, and can be instantly cleaned. They cover the useful portion of a quarter-plate (for enlargements to half-plate and upwards). There are two shelves, 15, for the negative carrier, 18, which takes quarter-plates or any smaller size either "horizontally" or "vertically," so as always to show a right-way-up image on the easel. The lower shelf is for the smaller negatives. Any portion of a half-plate within a 5-in. circle may be enlarged as well. Any part of a negative can be centred instantly on the easel. The easel measures 10 by 12 in. A drawing-board laid on it could take larger sheets of paper if required. To facilitate composing I use a white card, 17, scaled in inches and centimetres. The easel is clamped to its sliding base by a wing-nut, 25, and prevented from swinging by a pin, 26 (mine is a sardine-tin key), passing through easel and base. By drawing out the pin the easel can be swung. For non-scientific work this one movement suffices to correct distortion due to tilting. The easel also serves as a printing table for contact bromides and slides.

With this apparatus and a *f*/6 stigmatic of 4½ in. focus I can reduce to half diameter, copy to same size and enlarge up to 7½ diameters. By removing the easel and placing the paper on the floor, or on one or more books placed on the floor, a still greater degree of enlargement is attained.

Focussing is done on a piece of paper the same size as the desired print. For holding this or the bromide paper I made a holder, 19, of a piece of millboard to which is hinged a slightly smaller sheet of glass. Two wooden studs are stuck on the glass; one facilitates opening the holder, while both together enable the holder to be easily moved on the easel, thus placing the paper in position with the utmost nicety and expedition.

A minor feature very conducive to comfort in working

deserves mention. A round-headed screw, 23, is inserted at the side of the easel, and other screws, 24, are placed at the side of the upright at points indicating enlargements of 1 (same size), 1.7, 2, 2½, 3, 3½, 4, 5, 6, 7 and 7½ diameters. By laying the ball of the finger on the easel screw the tip will touch those on the upright when the easel is shifted. Any easel position can be obtained by touch alone. For use when the negative is placed on the upper shelf there is a second easel screw below the first, the distance between them being that between the shelves.

The advantage of this apparatus are:—No permanent occupation of floor-space; immediate readiness for use; no heating of condenser; less danger of vibration than with a horizontal model sprawling across the room; quick change from one degree of enlargement to another; instant centreing of any part of the image; rapid repeats of identical prints; a very brightly-lit "dark" room, with instant change from yellow to red (or green) for negative work.

My friend was so delighted with our results that he has built a number of these enlargers, one for himself and the remainder for other enthusiasts. These models are much nattier, have three windows instead of two, a rack-and-pinion movement for the light, a lens-board and bellows with quick slide and micrometer focussing, and uprights hinged so as to pack into a small space. The cost, complete except for lens, gas tubing and paper-holder, works out at about £8.

Vertical enlargers built for electric light cannot well be used for gas. This apparatus can be adapted for electric light without difficulty. Should electricity become available I shall discard the condenser and fit a top light—yellow and red (or green)—so as to get reflected light from the ceiling in addition to what is now available. LOUIS NELL.

THE PRACTICAL STEREO PHOTOGRAPHY OF SMALL OBJECTS.

(*Continued from page* 51.)

THE examples just given will probably serve to show that the task of photographing small objects is simplified, rather than made more difficult, by the adoption of this method. The erection of the verticals at a measured distance apart fulfils the same purpose as the drawing of a line of measured length, which is usually the way recommended for facilitating exact reproduction to scale. Further, the photographer can always supply himself with the exact *object distance* and *camera extension* whether he uses the correct lens or not, and the tedious necessity of repeated experimental focussing is thus entirely avoided. We have yet, however, to discover the working formulæ that will make him master of the process.

The problem of stereo photography is essentially three dimensional, since the image is to have width, height and depth, but there is only one dimension with which we need now concern ourselves—namely, the *width*, measured in inches, of the image, the object, the negative, and the print. The last two we hope to make identical. The dominant importance of width will appear as we go on. Each plane of the image and of the object will also have its own *distance;* but we will choose one corresponding plane in each, which we will call *image distance* and *object distance* respectively, upon which to build our formulæ. By carrying over two simple working principles from the previous investigation the other dimensions and distances will be correctly rendered without further attention on our part.

The photographer sets the problem and supplies particulars of what he wishes to be done; the stereoscope determines the conditions of success, and lays down certain limitations; the camera lens, like an obedient servant, merely takes its orders and obeys them. Let us formulate in due sequence the data we get from these three sources; we can then set about unifying them and reducing them to their simplest form.

The photographer wishes to produce images at a variable distance x, and on a variable scale n with regard to the original objects. Therefore, we have as our starting points :—

Image distance $= x$. *Image width* $= n$ times *object width*,

$$\text{or } \frac{\textit{image width}}{\textit{object width}} = n \quad \text{(Ratio 1)}.$$

This will be a convenient place to take note of the two working principles just referred to. They are (1) that if the image is to be n times the object and at a distance x, then *object distance*—the distance of the object from the camera lens—must be $\frac{x}{n}$; and (2) that *lens separation*—the separation of the camera lenses when taking the left and right negatives—must be $\frac{S}{n}$ where S is the normal eye separation, or inter-pupillary distance. With the introduction of this quantity S, which will be dealt with in its proper place, we depart from the possibility of strict mathematical precision, but not from that practical accuracy of result which is all that we require.

The above two principles may be set down in another form in which they may perhaps more readily commend themselves to our judgment :—

When *image width* = n times *object width*,
then *image distance* = n times *object distance*,

and separation of viewing points, i.e., *eye separation* } = n times { separation of taking points, i.e., *lens separation*.

Theory here becomes categorical, and declares this to be the only way in which correct perspective, correct size and correct distance can be secured in the image.

We now turn to the stereoscope to see upon what conditions it is willing to accept, and how far it is able to solve correctly the problem proposed to it by the photographer.

When a photograph is examined through a small magnifying glass, such as would be used in a stereoscope, there is, in spite of the obvious change of size, a strong inclination to imagine that we are still looking at the photograph itself. (It may be noted that this obsession, due to our previous knowledge of the actual nature, size and position of the object we are examining—knowledge which has been verified by touch as well as by sight—is one of the gravest obstacles to the realisation of the stereo image; it plainly indicates how imperative is the necessity that the image should be separated out from all other sense impressions, and given an existence of its own if it is to produce its full effect.) But if the lens is moved to left or right in front of the eye, the view is seen to move sharply in the other direction. We are therefore no longer looking at the photograph but at its image projected back to a greater distance. It is a fundamental principle of optics that the image of any point thus viewed through a lens lies on the right line connecting the point with the lens centre, and remains in a fixed position as long as the point and the lens remain fixed. Again, if the lens is held steady, and the eye is moved from side to side behind it, the image is seen to pass across the field of view in the same direction as the eye, just as stationary objects outside a window seem to respond to the movements of an observer within: there is no real movement of the image. This fact, that the position of the image in space depends upon the relative position of the lens and the photograph, and is independent of that of the eyes, is very convenient for our present purpose.

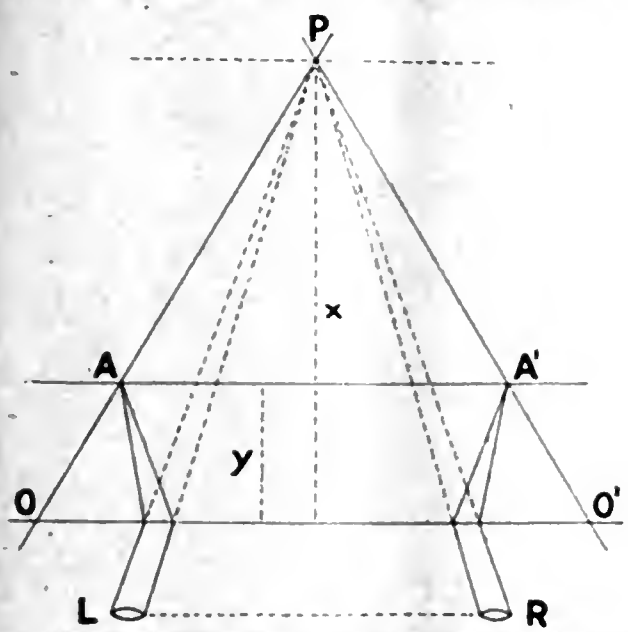
An elementary optical formula tells us that if the image of a photographic print is to be projected to a distance x from the centre of a lens of focal length f, the print must be placed at a distance y from the lens centre which is given by the equation, $\frac{1}{f} = \frac{1}{y} - \frac{1}{x}$; and that the size or *width* of the photo-

graph will be to that of the image as y to x. From the first of these expressions we can easily find that $y = \frac{fx}{x+f}$, and that $\frac{y}{x} = \frac{f}{x+f}$.

We have therefore: $\frac{\text{print width}}{\text{image width}} = \frac{y}{x} = \frac{f}{x+f}$ (Ratio 2).

The troublesome variable y can thus be got rid of from the working formulæ.

Let us suppose, Fig. 1, that a stereo print has been successfully prepared and placed in position in a stereoscope, of which O and O^1 are the lens centres. For the sake of clearness the angles and displacements in the figure are greatly exaggerated, and the lenses are only indicated by their centres. The distance OO^1 then represents the separation of the lenses, and the line through O and O^1 the plane of the stereoscope. Let A be a point in the left print, and A^1 the same point in the right print—representing, say, some prominent marking in a butterfly's wing. The line through A and A^1 will then represent the plane of the prints, and the distance AA^1 will be the distance between corresponding points in the two prints. The image of A will lie somewhere along the line OA, and the image of A^1 somewhere along the line O^1A^1. The condition of success is that



L, left eye. R right eye. O and O¹, centres of left and right stereoscope lenses (lenses not shown). A and A¹, corresponding points in left and right stereo prints. P, point of image. Width of prints A A¹ is determined by O O¹ and x. Perspective of prints is determined by L R, i.e., the prints must be such that when viewed from L and R they give correct perspective.

the image, in each case, should coincide with the meeting point P of these two lines. P will then be the position of this point of the image, no matter where the eyes, L and R, are held behind O and O^1. The figure makes it plain that, although the light in each case starts from the points A and A^1, it *really* enters the eyes as from the point P, and that the eyes are focussed and converged upon this point as in nature. The point P must also be at the vertical distance x from OO^1, this being the chosen distance at which the image is to be situated. A line through P parallel to OO^1 will then represent the plane of *image distance*. Finally, the whole image must be correct in size and perspective, not only for points lying in this particular plane, but for those in all other planes, whether in front of or behind it.

The separation AA^1 is constant for all points that are to be projected to the distance x. It is clear, therefore, that if the prints as trimmed for mounting are wider than AA^1 they cannot be properly placed in position. Either the inner edge of one print will overlap the other and cover it up, or if they are placed side by side the distance AA^1 will be increased and the whole of the resultant image displaced. The fact that the prints must not extend to a greater width at their outer or free edges may appear puzzling, but it is a rule well known to stereo workers that nothing must appear at the outer edge of either print which does not appear in the corresponding inner edge of the other. The distance AA^1, therefore, represents the full *print width* available in any case, and it is of the greatest importance that we should know its exact value, that we should be able to obtain it without difficulty, and that it should be automatically recorded on the negatives at the time of taking. The mere mechanical trimming of the prints to size by no means makes it certain that the contents of the prints will be correct or that corresponding points will be properly spaced.

It is easily seen from the figure that $\frac{AA^1}{OO^1} = \frac{x-y}{x} = 1 - \frac{y}{x}$.

Substituting the value of $\frac{y}{x}$ given above, and simplifying, we have:—

(a) *Print width* $(AA^1) = OO^1 \frac{x}{x+f}$.

We saw above, Ratio 2, that $\frac{\text{print width}}{\text{image width}} = \frac{f}{x+f}$. Substituting in this expression the value of *print width* just found, and simplifying, we have:—

(b) *Image width* $= OO^1 \frac{x}{f}$.

Since *image width* n times *object width*, we have, from (b):—

(c) *Object width* $= OO^1 \frac{x}{nf}$.

The expression (b) shows that the possible width of the image varies directly with x, and inversely with f. The stereoscope chosen should therefore have lenses short enough to give images of reasonable width for small values of x, but not so short as to increase the worker's difficulty in taking the negatives and securing precision in his results. The separation OO^1 of the stereoscope lenses also directly controls the width of the image, but as it is necessary that the eyes should be more or less centrally situated behind the lenses so that they may have an uninterrupted view, this separation should be made small. These and other considerations led the writer, for the practical purposes of this article, tentatively to recommend the stereoscope already described, having 4-in. lenses, with a separation of 2.5 in. The angle of view of 36 deg. from side to side given by this stereoscope seems quite as wide as is desirable from either the technical or artistic standpoint.

H. C. Browne.

(To be continued.)

Photographs of "Horrible Examples."—Groups of photographers were sent out during a recent temperance celebration in Tokyo to take pictures of drunken men in the streets and parks. This measure was taken by the National Temperance Association in the hope of disgusting the people with their actions while under the influence of liquor.

Death of Sir W. H. Christie.—Sir William Henry Mahoney Christie, who was Astronomer Royal for 30 years, retiring in 1910, died at sea, aged 77. He developed a passion for astronomy when a boy, and in 1831 was appointed Astronomer Royal. During the 30 years which followed he brought Greenwich Observatory to a fine level of efficiency. Under his direction and with the aid of the vastly improved instruments which he obtained for the observatory great progress was made in the work of photographing the sun and the stars.

Criminals as Cinematographers.—In the early days of our art, it was said that photography was a legitimate profession for those who failed the most miserably in other callings, but a noted American detective goes a step farther. The "Daily Chronicle" says:—"One of the greatest detectives of modern times—George S. Dougherty is staying at the Savoy Hotel. Dougherty, formerly a deputy commissioner of the New York police, and a member of the famous Pinkerton detective force, is in business in New York, and has been travelling Europe to investigate varying systems, and incidentally to keep in touch with the big criminals of the world. Friend of criminals who desire to give up the life of crime, Dr. Dougherty has put many of them into positions where they have made good. 'The criminal,' he says, 'is generally the man or woman who must have a life of excitement. It is no good putting them to drive a horse and van. I have found in several cases that work in connection with cinematography supplies the need, and they go straight in it.'"

FORTHCOMING EXHIBITIONS.

January 21 to February 4.—Partick Camera Club. Particulars from the Hon. Secretary, James Whyte, 51a, Peel Street, Partick, Glasgow.

February 7 to 11.—Sheffield Photographic Society. Particulars from the Hon. Secretary, James R. Wigfull, 14, Parade Chambers, Sheffield.

February 11 to 25.—Scottish Photographic Salon. Particulars from the Secretary, James F. Smellie, Braefindon, Allanshaw Street, Hamilton.

February 14 to 17.—Exeter Camera Club. Particulars from C. Beauchamp Hall, Hon. Exhibition Secretary, Exeter Camera Club, "St. Denys," Bellevue Road, Exmouth.

February 18 to March 4.—Edinburgh Photographic Society. Latest dates, entry forms, February 4; exhibits, February 9. Particulars from the Hon. Secretary, G. Massie, 10, Hart Street, Edinburgh.

March 1 to 6.—Birmingham Photographic Society. Latest dates: Entry forms, February 15; exhibits, February 23. Particulars from the Hon. Secretary, P. Docker, Medical Institute Buildings, Edmund Street, Birmingham.

March 4 to 25.—South London Photographic Society. Particulars from the Hon. Secretary, Harry Abbott, 61, Beauval Road, East Dulwich, London, S.E.22.

March 8 to 9.—Birkenhead Photographic Association. Latest date for entries, February 25. Particulars from the Exhibition Secretaries, Messrs. Longstaff and Trace, 33, Hamilton Square, Birkenhead.

March 14 to 16.—City of London and Cripplegate Photographic Society. Latest date for entries, March 4. Particulars from the Hon. Secretary, J. J. Butler, 7, Gresham Street, London, E.C.2.

March 15 to 26.—Welsh Salon of Photography. Latest date for entries, March 9. Particulars from the Secretary, H. G. Daniel, 154, Penylan Road, Cardiff.

March 28 to April 1.—Hackney Photographic Society. Hon. Secretary, Walter Selfe, 24, Pembury Road, Clapton, London, E.5.

April 5 to 8.—Leicester and Leicestershire Photographic Society. Latest date for entries, March 22. Particulars from the Hon. Secretary, W. Bailey, Cank Street, Leicester.

April 21 to May 11.—Hammersmith Hampshire House Photographic Society. Latest date for entries, March 30. Particulars from the Hon. Exhibition Secretary, J. Ainger Hall, 26, Bishop's Mansions, Bishop's Park Road, London, S.W.6.

Patent News.

Process patents—applications and specifications—are treated in "Photo Mechanical Notes."

Applications, January 16 to 21 :—

COLOUR PHOTOGRAPHY.—No. 1,319. Photography in two colours. O. Pfenninger.

REPRODUCTION PROCESS.—No. 1,562. Production or reproduction of a three-dimensional figure. H. M. Edmunds.

DRAWINGS FROM NEGATIVES.—No. 1,809. Method of making pencil drawings from photographic negatives. W. H. Jones.

PHOTOGRAPHING SOUNDS.—No. 1,574. Photographic sound-recording and light telephony. H. G. Matthews.

COLOUR CINEMATOGRAPHY.—No. 1,590. Colour cinematography. R. O. Percy.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1s. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

COLOUR CINEMATOGRAPHY.—No. 172,714 (Sept. 8, 1920). The invention consists in a method of making colour cinematograph films in which a set of full-sized images is produced on the negative film, with small-sized interposed images; from which negative film a positive film is produced by superposing successively the said images, brought to the same dimensions, and suitably colouring the different positive images.—Zoechrome, Ltd., 146, Bishopsgate, London, E.C., and Thomas Albert Mills, 72, Manor Street, Clapham, London, S.W. (Particulars of the process are given on another page in the "Colour Photography" Supplement.)

PHOTOGRAPHY OF THE LIVING EYE.—No. 173,439 (January 17, 1921.) A small reflector is formed in or carried by a transparent body, such, for example, as a glass disc or lens, which reflector will reflect a beam of light from the sun or from an artificial light into the eye, and will allow the image of the eye to pass around

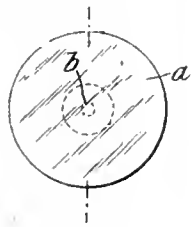


Fig. 1.

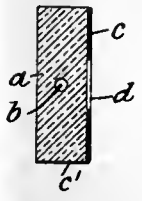


Fig. 2.

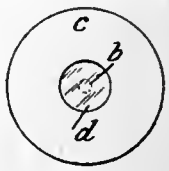


Fig. 3.

its exterior through the transparent body to the eye of an observer or into a photographic camera in front of which it may be fitted.

The reflector may consist of a bubble or cavity in a piece of plain glass, the bubble acting as a reflector and the plain glass surrounding the bubble allowing the image of the eye to pass through it around the exterior of the bubble into the camera, or to the observer's eye.

Instead of employing a bubble in a piece of solid glass two pieces of glass may be cemented together, each piece having a semi-spherical cavity formed therein. These two pieces are cemented with the two cavities facing each other. The two cavities may be employed to enclose a globule of mercury thereby rendering the convex surface which is towards the eye a better reflector.

The single piece of glass, or the two cemented pieces, may have plane incident and emergent faces, or they may be ground to form a suitable lens to co-operate in obtaining a clear image upon a photographic film or plate.

The transparent body is preferably blackened on one face to form a mask around the reflector, but leaving sufficient clear space around the latter for the rays to pass from the eye to the observer or into the camera.

Figs. 1, 2 and 3 show in front elevation, section and rear elevation, respectively, a construction of transparent body carrying or formed with a small reflector. Fig. 4 is a diagrammatic

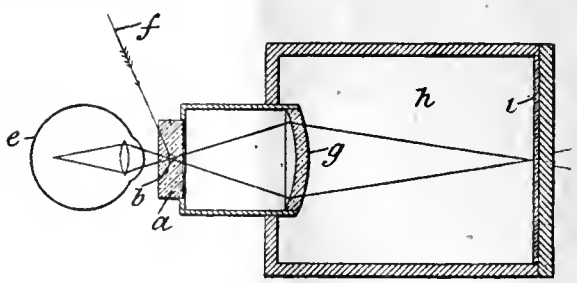


Fig. 4.

view illustrating the use of the device for obtaining a photograph of the interior of the eye.

In figs. 1 to 3 the transparent body *a* consists of a disc of glass with plane incident and emergent surfaces, having a small bubble *b* formed in the interior thereof.

Fig. 4 shows the apparatus used for obtaining a photograph of the interior of an eye *e*. Here the device is suitably mounted in front of the lens *g* of a camera *h*, and the interior of the eye being illuminated by the beam of light *f* reflected into it by the bubble or reflector *b*, the image of the eye passes to the lens *g* of the camera around the exterior of the reflector or bubble, so that an image of the interior of the eye will be formed on the sensitive plate or surface *i*.—Isaac Taylor, 4, South Terrace, Cork.

New Books.

AGENDA LUMIÈRE-JOUGLA.—The collection of tables, formulæ, and working instructions in the photographic processes, which is issued each year by MM. Lumière's firm, renders a service to French photographers somewhat similar to that afforded to those in the English-speaking countries by the "B.J. Almanac." It contains tables of weights and measures, solubilities, chemical equivalents, optical and exposure tables, and, within the space of about fifty pages, a little text-book on the practical working of the Autochrome process. Formulæ for developers, fixers and other baths for the making of negatives and prints by the various processes occupy two other large sections, and in the later part are particulars of the plates, papers and chemical preparations manufactured by MM. Lumière and Jougla. Altogether there are few books of 500 pages in which so much practical information is given in so small a space. The contents are made readily accessible by the provision at the end of the volume of both a table of contents and an alphabetical index. The book is published for MM. Lumière by MM. Gauthier-Villars, 55, Quai des Grands Augustins, Paris, at the small price of 3 francs.

THE "KINEMATOGRAPH YEAR BOOK," 1922.—The annual publication of our contemporary the "Kinematograph Weekly" comes to us in its ninth issue as a volume of over 500 pages, containing a most complete record of the various branches of the cinematograph industry. The "Year Book" is concerned chiefly with the production and renting of the films which are shown at the picture theatres, and contains copious particulars relating to these staple branches of the industry. For example, it gives a list of the films shown to the trade in 1921, arranged both in alphabetical order of film title and chronologically. Its list of films released runs from December, 1920, to December, 1921. In addition to including particulars of the trade associations connected with the industry, it contains a directory of firms of all descriptions interested in the trade, and also a list of the cinema theatres throughout the country, with particulars of their changes of programme, prices of admission, and description of electric supply. Another alphabetical section is a "Who's Who" of personages in the producing and renting trades. Technical and legal matters are not omitted from this compilation. Mr. Colin Bennett reviews technical progress during the past year, and adds some photographic and electrical formulæ of chief interest to the film printer or exhibitor. The "Kinematograph Year Book" is published from 93, Long Acre, London, W.C.2, price 5s.

New Apparatus.

THE C. R. LIGHT-PROOF AND AIR-TIGHT DISH COVER.—Mr. C. R. Rathbone, IIa, Sheep Street, Northampton, sends us a very novel form of cover for developing dishes in the shape of a wooden frame, or rather a shallow tray, the whole interior of which is lined by some resilient packing covered by thin rubber sheeting. This appliance, when laid on a developing dish with the rubber sheeting in contact with the rim of the latter, thus forms a light-tight and air-tight seal. Mr. Rathbone tells us, and we can quite believe it, that a dish protected by this cover may even be carried out into the daylight without harm, as regards fogging, to a plate in process of development therein. The cover has been designed by Mr. Rathbone as an aid in his own work of Press photography, and has been found of particular value in permitting other work being done by full illumination in the dark-room whilst plates were at the same time being developed. In similar fashion the cover has been found of service when making bromide prints by an exposed light in the dark-room. The cover is made in two stock sizes, one 15 x 12 inches for 9 x 7 and smaller dishes, price 8s. 6d., post free; the other 18 x 15 inches for 12 x 10 and smaller dishes, price 11s., post free.

X-RAYS HERO HONOURED.—One of the pioneers and first martyrs of X-rays, Dr. J. Hall-Edwards, of Birmingham, has been awarded a medallion and an annuity of £100 by the Carnegie Hero Fund Trustees.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, FEBRUARY 6.

Birmingham Phot. Art Club. "Carbro." N. G. Breeze.
Bradford Photographic Society. "Photography—Its Importance and Power."
Dewsbury P.S. "Amateur Photographer" Prize Slides.
Forest Hill P.S. Lantern Lecturettes by Members.
Kidderminster P.S. "Bromoil Transfer Process." Lord Hampton.
Leeds C.C. "Whitby, the Photographer's Paradise." J. Marston.
Southampton C.C. "Touraine." W. R. Kay.
South London P.S. "Screen Plate Colour Photography." H. A. Siggers.
Wallasey A.P.S. "How a Reflex Camera is Made." W. Butcher and Sons, Ltd.
Walthamstow and Dist. P.S. "Affiliation Portfolio." F. Judge.

TUESDAY, FEBRUARY 7.

R.P.S. "The Application of Flashlight Photography to the Study of Natural History Subjects." Oswald J. Wilkinson.
Belfast C.P.A. Camera Club. "Lantern Slide Making." D. J. Hogg, H.A.
Birmingham Phot. Soc. "A 400-Miles Walk in Dolomite Tyrol." James Shaw.
Bournemouth C.C. Instructional Evening for Beginners. J. Thomas.
Cambridge and Dist. Phot. Club. Demonstration of the Paget Process of Colour Photography. C. B. Coulson.
Exeter C.C. "Life in the Sea." F. R. Rowley, F.R.M.S.
Hackney P.S. "A Talk on London Landscapes." A. E. Farrants.
Leeds P.S. "Holiday amongst Birds." R. Chislett.
Morley P.S. Whist Drive.
Nelson P.S. Whist Drive and Dance.
Rotherham P.S. "Mont St. Michel." W. A. Barron.
Stalybridge P.S. "Old Processes and New Methods." W. F. Slater, of Messrs. Kodak, Ltd.
South Glasgow C.C. "The Soul's Expression in Photography." Dan Dunlop.
South Shields P.S. "Developers and Developing." J. R. Johnston.
Tyneside P.S. "K-Screen Photography." A. C. Collinson.

WEDNESDAY, FEBRUARY 8.

Accrington C.C. "Lantern Slide Making with Ilford Lantern Plates." A. Brooker.
Birkenhead Phot. Assoc. "Old Processes and New Methods." F. W. Slater.
Borough Polytechnic P.S. "The Way of the Lovely Sky." A. G. Buckham.
Catford C.C. "Psychic Photography."
Croydon Camera Club. Annual General Meeting.
Dennistoun A.P.A. "Portraiture." R. Crerar.
Ilford Phot. Soc. "Carbro." A. C. Braham.
Partick C.C. Members' Lecturette Night.
Photo Micrographic Soc. "Typical Section of Rock Forming Minerals." Prof. W. T. Gordon.
Rochdale Amat. P.S. Photographic Chat.
South Suburban P.S. Members' Lantern Slide Evening.
South Glasgow C.C. Lantern Slides."

THURSDAY, FEBRUARY 9.

Camera Club. "Deep Sea Life in the Atlantic." Prof. Johann Hjort, F.R.S.
Gateshead C.C. "Carbro." Dordan Pyke.
Hammersmith Hampshire House P.S. "English Fishing Towns and Villages." A. J. Linford.
Letchworth Camera Club. Open Night.
North Middlesex P.S. "Development." W. M. Rond.
Optical Society. Annual General Meeting.
South Glasgow Camera Club. Whist Drive.
Wimbledon and Dist. C.C. Bromoil Demonstration.

FRIDAY, FEBRUARY 10.

Glasgow and W. of Scot. A.P.A. Members' Whist Drive.
Wombwell P.S. "Across" H. Merrill.

SATURDAY, FEBRUARY 11.

Glasgow and W. of Scot. A.P.A. "Pompeii." J. Mac. F.G.S.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held [illegible] January 31, the president, Dr. C. H. Bothman in the [illegible]

Mr. Herbert H[illegible] delivered a lantern lecture on "Our Old Village Church Story." Mr. Wrench dealt particularly with [illegible] astical features of the minor churches and chapels, pointing out

many examples of interest to be found in churches in different parts of the country.

On the proposition of the chairman, a hearty vote of thanks was accorded to the lecturer.

SOCIETY OF MASTER PHOTOGRAPHERS.

The Society held a very successful meeting by kind invitation of Mr. N. S. Kay at his studios in Manchester on January 25.

There was a very large attendance of members, different sections in the Lancashire area being well represented. Mr. N. S. Kay welcomed the members to his studio, and stated he had no desire to set himself up as a superior person, but what he was going to shew them with regard to posing and lighting would, he hoped, help them to learn something from him as to the methods that he adopted. At the same time he desired it to be distinctly understood that he was not above learning from anyone else, and should any member during the demonstration desire to suggest anything to him, he would be very pleased to receive all the assistance possible.

Mr. Kay then proceeded to give his demonstration on posing and lighting. The lady who acted as the model proved herself very capable of filling the part, and during the demonstration, which lasted over two hours, Mr. Arthur Winter, the President of the Society, Mr. Percy Guttenberg, and other members gave demonstrations.

During the evening Mr. Lawrence, of Messrs. Kodak, demonstrated the advantages of flat films, and all the exposures made during the evening were made on the Eastman Portrait Films. Mr. Lawrence was assisted in his demenstration by four of his colleagues, and Messrs. Kodak did everything possible in order to make the evening a profitable one to all professional photographers.

At the conclusion of the demonstration a very hearty vote of thanks was proposed to the lady who acted as the model, and the President, Mr. Arthur Winter, asked the members to express to Mr. N. S. Kay their appreciation for his kindness in a true Lancashire fashion.

Mr. Gresswell proposed a vote of thanks to the President, and in doing so stated that the members were indebted to him for the arrangements that had been made that evening. This was the first of the series of interesting events which the President had arranged, and he assured the members that Mr. Winter was allowing nothing to hinder him from making his year of office one of interest and benefit to the whole of the members.

The President, in responding, thanked the members for the support they had given him that evening, and asked those present who had not yet paid their subscriptions for the current year to do so, so as to save the trouble and expense of the treasurer sending them further notices.

The Committee had recommended that a new rule should be introduced permitting members to nominate one of their assistants as affiliated member, so that the assistant would be permitted to attend such demenstrations. He asked the members to vote upon this recommendation, and being put to the meeting it was carried unanimously.

Mr. Percy Guttenberg has kindly placed his studios at the disposal of the Society for their next demonstration, and this will be held early in March, and each subscribing member will be furnished with full particulars in due course.

CROYDON CAMERA CLUB.

Mr. H. P. C. Harpur gave one of his unique expositions on "Transparencies and Lantern-slide Making," a not altogether vanished attack of lumbago stiffening his neck towards his audience.

First came a uric-acid comparison between the combined technician and artist (so well illustrated by the lecturer) and those deleful people who filled eveninga with abstract papers on optics and other scientific subjects; these who read from manuscript and departed without the expenditure of a scrap of mental effort. "Attaché-case merchants," scornfully said Mr. Harpur.

He then brought forward an apparatus resembling a guillotine, whose blade descended in steps, but refrained from describing its application. A more "glorified" and complicated model followed, of which a full description was given in loving terms. It afforded strip exposures behind a negative capable of being turned any way, the contrivance being guaranteed light-tight before and after exposure. He, the lecturer, had been round the appliance with a lighted match and could swear to the accuracy of this statement. It appeared well adapted for the purpose, and more convenient than the strip of card usually used by less ingenious mortals.

By its aid a transparency was exposed in strips, and when the best exposure was found it was repeated for the whole plate. When developing it he imparted the somewhat remarkable new that for fear of oxidation he never washed. Also for desperate cases it was advisable to filter the hypo solution.

Finding the right exposure in the same way for a lantern plate a capital slide was secured of a first-class sepia tone. To do Mr Harpur bare justice it must be said that he invariably obtains most pleasing shades of sepia, and his somewhat monotonous formula is as follows:—

A.—Ammonium bromide	1 dr.
Water to	10 drs.
B.—Ammonium carbonate	1 dr.
Water to	10 drs.
C.—Ammonia, .880	1 dr.
Water to	10 drs.

Dissolve two grains tabloid pyro in about half an ounce of water; take 40 minims each of A and B; add 21 minims* of C, and make up to 11 drs.

An acid fixing bath was to be avoided as it injured the tone. "The same remark applies to sepia bromides," confirmed Mr. Wadham. "I am not lecturing on bromide prints, Sir," fiercely lumbagoed Mr. Harpur. Mr. Sellors here gently pointed out that the interruption was by way of support, and not opposition. "I require no support," snapped Mr. Harpur, defiantly throwing back his head and catching a nasty rick of the enemy in consequence.

The demonstration closed with a lantern-show of the (normally amiable) lecturer's slides, and they certainly were "top-hole" in all respects. Having regard to his indisposition the discussion was of a comparatively kindly nature, even the miserable "attaché-case merchants" forbearing. Mr. Vivian Jobling said that mindful of present high prices, trial exposures had been made on gaslight papers of Wellington's as a guide to correct exposures on their gaslight lantern-plates. Once the key ratio was found the method worked well. There was no reason why any bromide paper should not be used with any lantern-plate once such ratio was ascertained. A most hearty vote of thanks was accorded the lecturer lumbago and all, for an instructive and highly amusing evening.

Commercial & Legal Intelligence.

NEW COMPANIES.

Electric Printers and Designers Equipment, Ltd.—This private company was registered on January 20, with a capital of £500 in £1 shares. Objects: To take over the business of an electrical photo copier, designer and draughtsman carried on by F. J. Morgan at 30, Wind Street, Swansea, as the "Electric Blue Printing Co." The first directors are: F. J. Morgan, Ll Breos, Mayals, Swansea, mechanical engineer; R. N. Perkins, 18 Eaton Crescent, Swansea, mechanical engineer; T. A. Goska "Skeena," Park Drive, Swansea, mechanical engineer. Qualification £25. Registered Office: 30, Wind Street, Swansea.

Sunbeam Tours, Ltd.—This private company was registered on January 24, with a capital of £2.000 in £1 shares. Objects: To acquire the interests of H. Cox in the Sunbeam Tours, includir all patents, royalties, stock-in-trade, book and other debts, an trade marks, and to carry on the business of photographer publishers of photographic appliances, manufacturers of sunscope stereoscopes, and other optical instruments and lantern slides, et

* It was stated that the odd 1 minim is most important. Fatuous ide of "attaché-case merchants" as to the strength of ammonia solutio varying in use should not be allowed to influence the mind.

The first directors are: W. Richards, "Shrublands," Hersham, Walton-on-Thames; G. H. Clarke, 2, Southgate, Sleaford, Lincs.; H. Cox, 18, Clifton Road, Weston-super-Mare (managing director), all permanent, subject to holding 250, 250 and 750 shares respectively. Registered Office: 69-70, Fleetwood House, High Holborn, W.C.1.

ORION PUBLICITY SERVICE, LTD.—This private company was registered on January 24, with a capital of £500 in £1 shares. Objects: To take over the business of advertising agents and consultants, designers, photographers, printers and publishers, carried on by W. B. Price, A. F. Beard and A. H. Lodge, at Stockport, Cheshire, as the "Orion Publicity Service." The permanent directors are: W. B. Price, 62, Vicarage Road, Stockport, advertising agent; A. F. Beard, 6, Rae Street, Stockport, artist and designer; J. Ridgway, 55, Shaw Road, Stockport, advertising agent. Qualification £100. Remuneration as fixed by the company. Secretary: W. B. Price. Registered Office: Mansion House Chambers, High Street, Stockport.

News and Notes.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.—At the annual general meeting held on January 19, Dr. B. T. J. Glover was elected president for the present year, Mr. J. Mansell treasurer, and Mr. Frederick S. Richards hon. secretary.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.—Mr. E. C. Ridge has resigned the position as secretary which he has filled during the past eight years. He is succeeded by Mr. W. M. Bond, 24, Henningham Road, Lordship Lane, London, N.17. Meetings of the society will in future begin at 7.45 instead of 8.30.

MR. H. C. MESSER, who for many years has been in business as a photographer in Salisbury, has returned to his native Ealing, having acquired the studio of Mr. F. C. Vinall at 7, Florence Terrace, Ealing, London, W.5. Mr. Messer has disposed of his Salisbury business to Mr. A. E. Cox, his manager there for some months past.

LEYTONSTONE CAMERA CLUB.—This club is arranging an exhibition to be held from March 16 to 18 at St. Catherine's Hall, Leytonstone. There is one open class in which, as also in all the advanced classes arranged for members, a plaque will be awarded. The latest date for receipt of entry forms and exhibits is February 28. Prospectus and entry form from Mr. Sidney W. Liddell, Cliddesden, 29, Fillebrook Road, Leytonstone, E.11.

A MAGISTRATE-PHOTOGRAPHER.—There was an unusual incident at the Hay Police Court last week during the hearing of the Armstrong poisoning case. A daily paper states that on the bench was a magistrate who had not been taking part in the proceedings. When the acting magistrates retired to consult in private, he produced a small camera and took a photograph of Armstrong, who at the moment was leaning over the dock to consult his solicitor.

THE CARBRO PROCESS.—The Autotype Company sends a 16-page booklet on the Carbro process, written by Mr. A. C. Braham, and embodying the very practical instruction in the process which Mr. Braham gives in his society demonstrations. The booklet is obtainable free on application to 74, New Oxford Street, London, W.C.1. The demonstrations of the Carbro process at this address, which have been given during January, have been so well attended that the Autotype Company is continuing them during the present month.

"THE CLUB PHOTOGRAPHER" for February is a Manchester number, and includes contributions by a number of writers of note. Mr. S. Grimshaw has a good many hints to give from his long experience in the Bromoil process; Mr. James Shaw lets us into some of the secrets of his superlative technique in lantern slide making; and Mr. Raymond Crowther discourses on the way one should go in the fixing of plates and papers. There is another article on Bromoil by Mr. James R. watt, describing and illustrating the making of a press for the transfer process.

BAB'S TALBOTYPE BALLAD.—A long-lost "Bab Ballad," written and illustrated by the late Sir W. S. Gilbert, but never published in book form with his other famous Ballads, appeared in last Monday's "Daily Chronicle," though it appeared originally in "Fun" on July 4, 1868. The ballad tells of the doings of "Sir Conrad Talbotype, of Talbotypetonneville." The name of the knight must have been suggested to Gilbert by the Talbotype (or Calotype) process. There are, however, no other photographic words in the ballad.

"THE PROFESSIONAL PHOTOGRAPHER."—In the January issue Messrs. Kodak, Ltd., have an illustrated interview with two Midland photographers, Mr. H. H. and A. J. C. Dudley, of West Bromwich. There is an interesting account of the work of Mr. Dudley Hoyt, of New York, and among the advertisements we notice the first announcement of the Eastman portrait diffusion discs for attachment to any lens, converting the latter into an instrument giving one or other, according to the choice of the disc, of two moderate degrees of diffused definition.

PRIZES FOR MOTHER AND CHILD PORTRAITS.—A first prize of £100 is offered by the "Weekly Dispatch" for the most effective photograph showing a mother and child, the age-limit for the child being eight years. Photographs are invited from all over the British Isles, and second and third prizes of £25 and £10 are also offered. During the run of the competition interim prizes of £5 5s., £2 2s. and £1 1s. will be given for the best photographs reaching the "Weekly Dispatch" during any individual week. Simultaneously a similar "Grandmother and Child" competition will run its course with a £10 first prize.

THE LONDON CAMERA EXCHANGE CO., LTD.—Messrs. Robbins & Manstre, of 2, Poultry, Cheapside, London, E.C.2, is a firm of dealers in secondhand apparatus which has so soundly established its position for fair dealing in buying and selling that its periodical catalogues of the goods which it offers for sale are of more than ordinary interest. The present list consists of 64 pages of itemised descriptions of apparatus in the way of enlargers, vest-pocket and other small cameras, reflex cameras, folding focal-plane and other hand and stand cameras, lenses and miscellaneous instruments. The variety of goods described in these pages should afford the widest opportunity of choice on the part of purchasers of equipment for the coming season.

PROCESS WORK AND THE PRINTER.—The house organ of Messrs. Penrose & Co., 109, Farringdon Road, which for many years has been issued as "Process Work," will shortly make its appearance as an independent public journal of the title "Process Work and the Printer." It will appear quarterly, and will consist of at least twelve large quarto pages of text, together with specimens of the latest processes in photo-mechanical reproduction and printing. Publication has been transferred to Messrs. Percy Lund, Humphries & Co., Ltd., by whom the new journal will be printed. Under the editorship of Mr. William Gamble, head of Messrs. Penrose & Co., the endeavour will be to make the new journal of the greatest technical interest. The annual subscription will be 5s., post free 6s.

Correspondence.

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

*** *No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

BURNS FROM THE RESULT OF FIRING FLASH POWDER

To the Editors.

GENTLEMEN,—Recently I was taking a flashlight photograph of a very big fancy dress ball, and on filling a German flash lamp with powder the lamp sprang slipped and fired 4 ozs. of the powder, including what was left in the tin. Being in the country and no doctor handy I was taken into a farm house with

terrible burns on my right hand and arm. The farmer's wife applied what I think was a very simple remedy She took about 2 *to* 4 *ozs. of carbonate of soda, grated a raw potato*, and mixed the two into a sloppy poultice (cold). She applied this on a piece of linen, and completely enclosed my hand and arm. The pain went in five minutes, and I had no further trouble. The plaster was kept on for two days, after which I smeared the parts with zinc ointment until all the skin had healed. In a week I was quite cured. My camera case now always contains a supply of carbonate of soda, some lint, and a good-sized potato in case of accidents.

B. Hollins.

16, Oxford Street, Harrogate

THE P.P.A. CONGRESS.

To the Editors.

Gentlemen,—Many thanks for inserting my letter last week. Mr. Lang Sims' statement in the same issue, explaining the reason which decided the Council to alter the time and venue of the 1922 Congress, put an altogether different complexion on the matter. I trust it will satisfy the majority of our members as it does myself, and I hope when the time comes to be able to attend the Congress, and that its success will reward the Council.—Faithfully yours,

S. H. Greenway.

27a, Abington Street,
Northampton,
January 25.

To the Editors.

Gentlemen,—My attention has been directed to a paragraph in last week's issue on the above subject by one who signs himself "Scottie," inviting me as President to give my opinion on the change of date of the Congress.

If the gentleman will kindly put his name and address to the letter I will gladly answer his question. I do not think he honours dear old Scotland by withholding these.

A. Swan Watson,
President P.P.A.

Viewpark Studios,
Edinburgh.

To the Editors.

Gentlemen,—The manifesto of the Council of the P.P.A., recently published in the "B.J.," conveys the impression that its authors are beginning to realise that their action in removing the Congress and altering its time of meeting, on their own responsibility, without having taken any steps to ascertain the wishes of the members generally, has led them into an awkward position. The Congresses hitherto have been most successful. The difficulties arising from the now alleged want of sufficient accommodation have not been apparent, and have not marred the enjoyment. The inherent features of such a gathering, under the circumstances, its picnicky character, the fullness of life and movement, the casualness and the absence of formality, all combined in promoting that freedom of intercourse so essential to success. Under the new conditions, under a different atmosphere, that of aristocracy and fashion, the proceedings, no doubt, will be conducted with a solemnity suitable to the locality. We may gain in dignity, which we do not want, but we shall certainly lose that holiday spirit that we do want.

In my business in a country town over 200 miles from London I am dependent for any knowledge of what novelties and kinds of materials, etc., there are in the market upon the visits of travellers, and for that reason I have been accustomed to pay an annual visit to London in the spring to look round. To join the Congresses, of which I have attended all except the first, has therefore exactly suited me; for in the Fair I have been able to find, gathered under one roof, all the principal dealers have to offer, leaving me plenty of time to join in the outings and festivities of the Congress. I cannot afford two journeys, so in future I lose the Congress. If the Council had shown that any material advantage would follow the change I should have accepted the position in silence; but I feel sure that if the members had been consulted a considerable proportion would have voted for the old lines being followed. There could have been no difficulty in obtaining the views of the members. What is the P.P.A. Circular for?

By the way, why was the Circular stopped? Every number was full of glowing testimonies to its usefulness, and, beyond frantic appeals to pay subscriptions, hardly anything else. Just when its real usefulness arises, it stops. That the Council was so overworked in the business of the incorporation is an excuse that does not appeal to one's reason. Then again, what was the actual motive for turning the Association into a limited liability company? When I first joined there was an accumulated fund of about £200. That amount has steadily increased to over £1,000, a sum quite sufficient to cover any loss or expense that could be reasonably incurred under careful management. Do the Council contemplate any enterprise of such highly speculative nature as to involve a risk of swallowing up their reserve, still leaving a liability for more? If not, why have they accepted the serious inconvenience of working under the restrictions and obligations of the Companies Acts in return for a protection that should never be required? Some of us used to think the Council's policy safe, but unenterprising; are we to read the signs of the times that in future it will be enterprising but unsafe?

A Country Member.

To the Editors.

Gentlemen,—The correspondence *re* P.P.A. has been very interesting, and having been a member since the start and attended every Congress, I should like to state my views. There is no doubt, in my mind, that the autumn Congress will be a failure without the Photographic Fair. The latter, in my opinion, is of equal importance to the Congress, and a decision of this sort should have been arrived at only by a referendum of members.

With regard to last Congress, it is evident that other members than myself were highly amused at the almost childish way the Council acted on every occasion—at the Guildhall, at Messrs. Kodak's, and on every public appearance. In fact, one almost felt afraid to touch the hem of their garments, particularly at the Guildhall, where special seats were reserved for "Council only." Then as to the Circular. This effusion cost a great deal of money and contained nothing but what had already appeared in your splendid journal, and certainly was of no value to any professional, but a repeated account of Council meetings.

Well, gentlemen, I trust no one will think I do not value the Association. I do and shall hope it will prosper, but let us have the Congress and Show together in April, when we can all spare the time, and let the Council drop the autocratic manners. They are only in that position by reason of the members' votes. Also let them give us lectures that are of educational value, not slides showing results only, but how to obtain those results, and so make the Association of real benefit to all its members.—Faithfully yours,

Fred Gegg.

Evesham,
January 20

THE INCOMPETENCE OF THE AVERAGE PHOTOGRAPHIC ASSISTANT.

To the Editors.

Gentlemen,—With reference to "Belgravia's" letter, in which he deplores the incompetence of the average photographic assistant, it seems that he must be either very unlucky in his search for a "really competent" finisher or very fastidious!

It is, of course, well known that there are a good number of "dud" workers, but this can be said of all trades and professions.

To a very great extent photographers themselves are to blame for this state of affairs. We call photography a "profession" Ye gods! Yet it is common knowledge that for unprofessional-like methods photographers are hard to beat. This is particularly obvious in the engaging of assistants. In an interview it is always "What salary do you require?" not "What can you do?" and the applicant who asks the lowest figure obtains the situation.

How many employers do we meet who take an interest in their assistants? How many who will listen to practical suggestions for the improvement of the work? Why is it that in one studio over-

time is paid and at another place it is *not*! This especially applies to Christmastime. Why do not employers spend a little more money on their workrooms instead of calling a cellar "my printing room, you know!" or an ill-ventilated shed "our dark room." Of course, it sounds very splendid to customers—who never see behind the scenes—but does it tend to make the assistants efficient or interested in their work. Even some of the high-class West-end studios do not provide workrooms or equipment which could be called even "fair." I also recall certain studios where the staff was mostly composed of "learners."

Certain successful photographers *do* adopt business methods, and it is reflected in the efficiency of their staff. But efficiency costs a little extra money. Therefore Mr. Average Photographer—penny wise and pound foolish—prefers to pay less and puts up with "dud" workers.

I agree with "Belgravia" that in the States assistants are thoroughly looked after and properly trained, but it is too much to expect in this tight little island, where the employer refuses to treat his assistants as human beings.

Here is a chance for the P.P.A. to shine—and earn the gratitude of efficient assistants—by standardising wages in photography, and generally helping the cause of the assistant.

I hope, gentlemen, you will excuse the length of this letter, but my excuse, if one is needed, is the fact that the assistant does not obtain a hearing in your columns too often.—Yours truly,

I Gotta Job.

To the Editors.

Gentlemen,—I agree with what "Belgravia" has said, as far as it goes, and I write with considerable knowledge of the subject. I have heard that the American photographers do surpass ours in "putting their apprentices and assistants through it," but even in the finest studios in the world, American or otherwise, they do not keep teachers on the premises, but only highly-skilled workers, who are not always ready and willing to impart their expert knowledge to apprentices, even if gifted with the ability to teach, for they feel that they have been engaged as workers only, and paid only for their services, and not as teachers. They also hear the little bird twittering in their ears that sometimes old employees are sacked to make way for younger and more energetic men or women, and so, if they do teach, or try to teach, more often than not it is in a very indifferent and careless manner—it is nothing to them, but they cannot refuse very well; but just think of the limited scope for teaching offered to even the cleverest workers in a studio, only an occasional apprentice. Teachers are not made by such slip-shop occasional methods as those.

Most apprentices learn, according to my experience, a fair amount about operating, a good deal about all kinds of printing, mounting, spotting, general usefulness in the studio in the "fetch and carry" direction, but when it comes to negative retouching, finishing enlargements in monchrome or colours, miniature painting and tinting, pastels, etc., well, out of every ten old apprentices or assistants who have come to me for lessons in the above-named branches I have found that quite seven have been very badly taught indeed, and I have invariably had to make them discard nearly all their acquired methods, and have had to make them commence from the very beginning.

I do not blame the photographers, for, as stated, they are not teachers, and teaching is an art in itself, and whilst one of the workers may be trying to teach an occasional apprentice, I have taken in hand hundreds during the 25 years that I have been teaching the beginner or improving and quickening the slow or defective retoucher or artist, and since I originated my postal system of lessons on the art side of photography I have, with the help of a little band of real West-end experts, given thousands of postal and personal lessons. I had considerable trouble in finding these artists willing to help me in my scheme of tuition, and it has taken me years to accomplish my purpose, but I have them now, men who are, and have been, chief finishers for many year to noted houses. I also arrange for lessons in posing and lighting by an F.R.P.S. who has been chief operator for leading West-end studios. Printing, developing and general routine of the studio and dark-room are also taught. A pupil takes up one or two subjects, and in six lessons in each will learn more than in a three years' apprenticeship, for the lessons are direct and concentrated, and the pupil gathers the fruits of the teachers' 30 years' experience as a high-grade practical worker, and is never turned away with "a little about everything," but knows a very great deal about the subjects studied.

Many of my pupils have become head workers for West-end studios, some have splendid studios of their own here and abroad, many have become trade workers, all have made good progress, and some have displayed genius. I have taught for the Ministry of Labour, and am on their list, after several interviews and very close scrutiny of my qualifications, and the pupils they have sent to me have made excellent progress. I have no classes, but every pupil has lessons directed solely to his or her advancement, and everything is done to really teach the subject taken up. Class-work means divided attention, and therefore cannot be as quick in its results or as effective as purely individual instruction. I and my little staff of expert instructors are prepared to take in hand all those who feel that they are slow or defective in their results and working, or who wish to begin from the first rung of the ladder.

I will guarantee to advance them quickly and effectively, and in the case of apprentices who are earning "15s. per week" after "three years in a high-class West-end studio," and who need "finishing off" (if not commencing from the beginning), I will give them this hope: "Men (and women) may rise on stepping stones of their dead selves to higher things," and, I can assure them, higher wages.—I am, yours faithfully,

T. S. Bruce.

4, Villas-on-Heath, Hampstead, N.W.
January 30.

METOL POISONING.

To the Editors.

Gentlemen,—Having been a martyr to the above poisoning for many years, and having at last cured myself, no doubt many of your readers would like to know the remedy. I have tried every ointment and treatment, including the medical baths at Harrogate, without any result.

I take 4 ozs. of soda carbonate to 1 pint of boiling water (after the day's work), place my hands in the solution, and soak for 15 minutes, or until water becomes cool, and all the itching of the skin disappears. I then dry hands thoroughly, and then rub well in the "B.J." remedy for metol poisoning, viz.:—

Ichthyol	10 grs.
Lanoline	40 grs.
Boric acid	40 grs.
Vaseline	30 grs.

Well rubbed into affected parts three times daily.

When using M.Q. developer I keep a dish containing 20 drops hydrochloric acid to 1 pint of water, and immerse the hands before, during and after development. Since using the above I have not had the slightest trace.—Yours truly,

Bernard Hollins.

16, Oxford Street, Harrogate.
January 24.

THE FIRST TEXT BOOK OF BROMIDE PRINTING.

To the Editors.

Gentlemen,—I read with great pleasure Mr. Woods' communication in your last issue. It is interesting in more ways than one, for it recalls many memories of the old days, and the discussion on the advance of gelatine bromide emolsion.

I can safely confirm your note to Mr. Woods' letter, for when I came here I had the Polytechnic formula by Howard Farmer in my note-book, and found my father busy with Abney's "Photography with Emulsions" in 1883, and enlarging with Morgan and Kidd's paper by daylight. When the clouds were favourable he produced some good toned enlargements with the ferrous, or a late developer which Morgan and Kidd recommended.—Yours faithfully,

Henry Holman.

Banff, January 30.

SHARPENING RETOUCHING PENCILS.

To the Editors.

Gentlemen,—With reference to recent hints in your Journal, on quick ways of obtaining a good point on a retouching pencil, I find a carborundum wheel the quickest and best means, a few turns of the wheel, whilst holding a pencil to the side of the stone, and a perfect point is obtained; of course, the pencil must be slowly turned round, and the finest or smoothest stone used. In less than half a minute a new lead can be sharpened to a perfect point.—Yours faithfully,

SWEATMAN HEDGELAND.

Broadway, Maidstone, January 30, 1922.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

D. W.—Most London photographers get their blinds from the large furnishing houses, such as Maple, Shoolbred or Waring. You might ask for estimates from them, and also from John Hall and Sons, blind makers, 217, Hornsey Road, London, N.7. Ask for metal barrel roller blinds.

W. H.—The best advice we can give you is that you write to the Kodak Co. for their booklet, "Photographing Paintings," which was written by an expert copyist of paintings, who previously had contributed much of the matter in the shape of articles in the "B.J." You will find that panchromatic plates are almost essential, and require to be used with a relatively deep screen, such as K3.

R. B.—The book is "Minutes of Proceedings of Thirty-ninth Annual Convention, Photographers' Association of America." The secretary is Mr. J. C. Abel, 421, Caxton Building, Cleveland, Ohio, U.S.A., from whom no doubt a copy is obtainable. We do not know the price, and apparently the book is not on public sale, but very likely the Association would send you a copy by way of courtesy.

E. E. E.—We have indicated the smallest area of glass with which you will be able to work effectively. If you are likely to take large groups, we should recommend extending the light as far as the dotted lines. You would, of course, only be able to take groups or full-lengths at one end of the studio, but could manage heads or half-lengths by placing the background at B 2; with a fairly short-focus lens you could take full lengths this way of the studio. It would practically necessitate rebuilding the whole structure to convert it into a single slant studio.

N. Z.—We think it is going rather too far to adopt a card of the form which you attach to your letter, since this suggests, to our mind, that you are a representative of the papers. There would be no objection if you put above the names of the papers the words, "Contributor of photographs to." It seems to us that this is an ordinary measure of precaution, for the reason that no doubt the papers have representatives in your district, and unless you do something such as we suggest, you are likely to invite unfavourable notice from any authorities who know of the existence of the other Press photographers holding official commissions from the papers.

C. H.—Almost all the printing-boxes on the market can be obtained in models suitable for a gas illuminant. An inverted mantle burner is exceedingly suitable for a vertical enlarger, but with the exception of the expensive outfits, such as the Eastman Projection Printer, there are no vertical enlargers on the market. We have an article in type, to appear within the next week or so, describing exactly how to make a vertical enlarger for gas illumination. As regards a ceiling light, it is not so easy to adapt gas, but quite practicable to suspend a large box from the ceiling with a canary fabric covering on its upper open end, and an inverted mantle fitted in it. In this case you must have the inside of the box of ample size, and painted a matt white. We should think perhaps it would be better to discard the idea of a ceiling light in favour of a lamp hung a foot or so from the wall and fitted with an upright burner, a direct light from which through the canary fabric would be cast on the wall and reflected as a dim illumination throughout the room. The worst of gas for these ceiling lamps is that you must provide ample openings for entrance of air and escape of the products of combustion, and, at the same time, must light-trap these.

J. B.—We are sorry that we do not know formulæ for emulsion for direct positive cards or plates. So far as we know, no such formulæ have been published. We should have thought that you could get on quite satisfactorily with the sensitive materials supplied by either the Quta Co., 252-254, Haydon's Road, Wimbledon, London, S.W.19; Magna Co., 2, Eastborough, Scarborough; or Moore and Co., 101-103, Dale Street, Liverpool. A formula for a combined developer-fixer for ferrotype plates is as follows:—

Water to make	40 ozs. fluid.
Hydroquinone	½ oz.
Soda sulphite	4 ozs.
Soda carbonate	4 ozs.
Hypo	8 ozs.
Liq. ammonia .880	2 fl. ozs.

Addition of more ammonia to the developer gives more vigour. The plates develop (and partly fix) in two or three minutes. They can then be examined in daylight and fixed in plain hypo.

C. R.—We advise you first of all to copy the print on to a process plate, preferably through a blue filter, as by putting the print behind a thin blue glass. Methods of restoring are very uncertain, but we give details of processes which have been recommended:—One process is to bleach the yellowed print in a mercuric chloride solution, as used for intensifying, well wash, and then to develop in an old hydroquinone or metol developer (without bromide), or preferably to immerse in a 5 per cent. solution of sodium sulphite, and, finally, wash well. This process is not reliable. An elaborate process of restoring silver prints, and one for which the inventor (H. Jandaurek) was awarded a silver medal in 1888, is as follows. Two solutions are required:—

A.	Distilled water	45 ozs.	1,000 c.c.s.
	Sodium tungstate	608 grs.	5 gms.
B.	Distilled water	1 oz.	400 c.c.s
	Calcium carbonate (pure)	5 grs.	4 gms.
	Chloride of lime	1.2 grs.	1 gms.
	Gold and sodium chloride	5 grs.	4 gms.

The B solution should be kept in a yellow bottle, or in the dark for twenty-four hours. The faded prints are unmounted, well washed, and placed in 8 ozs. of the A solution, to which ¼ oz. to ½ oz. of B has been added. They should remain in this toning bath until they assume a good purple tone, and they are then well washed a fixed with "hypo" (1 oz. to 10 ozs. of water) until all the yellowness has disappeared, which may take one hour or more; finally they are washed well.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. PRICE FOURPENCE.

TERMS OF SUBSCRIPTION POST FREE.

UNITED KINGDOM OR CANADA.—*One Year*, £1 1s. 8d.; *Six Months*, 10s. 10d.; *Three Months*, 5s. 5d.

ANY OTHER PART OF THE WORLD. *One Year* ..... £1 3s. 10d. *Six Months* ... 12s. 0d. *Three Months* 6s. 0d.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibits the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

HENRY GREENWOOD & Co., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3223. Vol. LXIX. FRIDAY, FEBRUARY 10, 1922. Price Fourpence.

Contents.

SUMMARY.

Mr. Charles H. Davis, the accomplished New York photographer, who has just held a one-man exhibition of his works in that city, contributes an article full of suggestions for composition in the posing of sitters for portraits. (P. 75.)

The making of portraits, specially with a view to colouring, is the subject of an article by an expert colourist. (P. 77.)

In the present period of depression we offer for consideration by portrait photographers a national advertising campaign which, if carried out efficiently, should very greatly increase the demand for photographic portraiture. The suggestion is based on the broad view that in the bulk photographers' competitors are the firms offering goods which are not necessaries of life. (P. 74.)

Unfavourable comment has been made on the announcement that only two cameras are to be allowed in Westminster Abbey on the occasion of the marriage ceremony of Princess Mary. (P. 78.)

In a contributed article Thermit describes how prints which refused to tone in the hypo-alum bath were made to do so rapidly by immersion first in a solution of hypo and then in one of 1 14 sulphuric acid. (P. 80.)

The Eastman Research Laboratory has reported on the use of successive baths of sulphuric acid and hypo as an odourless method of sepia toning. Similar processes were recommended some nine or ten years ago. (P. 74.)

Mr. J. G. F. Druce, reviewing recent work in France on the preservation of the amidol developed, states that amidol may be manufactured so that minute traces of tin salts remaining in it act as a preservative of the developer when subsequently dissolved with the customary proportion of sulphite. (P. 81.)

Unequal reduction of individual prints of a batch of bromides by longer or shorter immersion in an acid fixing bath may be avoided by following one or other of two plans. (P. 74.)

Developers for the production of relief prints by tanning of the gelatine in proportion to the amount of silver produced in different parts of the image are the subject of a recent patent specification. (P. 82.)

The humour of optics appears to dog the steps of Mr. C. P. Crowther; at the Croydon Camera Club the lurking power of a fierce focus aroused comment. (P. 85.)

At the Royal Photographic Society, on Tuesday evening last, Mr. Oswald J. Wilkinson described his practice of using flashlight for obtaining records of Nature subjects by night. (P. 84.)

A camera for making records of race finishes has been patented by a German optical firm. (P. 82.)

A gas water heater for a photographic workroom may be of one or other of two convenient patterns. (P. 73.)

Ample exposure of the warm-tone development papers is recommended in order to secure the full warmth of tone of which they are capable. (P. 74.)

EX CATHEDRA.

Workroom Water Heaters. The convenience of a constant supply of hot water in photographic workrooms is perhaps not appreciated as much as it should be by many photographic employers, not only on account of the saving of time and labour in making up solutions, but also as regards the comfort of assistants. Where hot water is not provided throughout an establishment from a central boiler it is a comparatively simple matter to fit, in rooms which require it, a gas water-heater which is quite efficient for the ordinary moderate requirements. These heaters are of two types, namely, those which give a moderate flow of hot water within a few seconds of lighting a gas-burner of fairly large size, and those in which a few gallons of water are kept hot in a tank by a burner which is automatically lowered as soon as the water reaches a certain temperature, the flame likewise automatically increasing when cold water enters to take the place of the hot which is drawn off. Both these types are supplied in several sizes by makers of gas-heating appliances, such as Messrs. Fletcher Russell of Warrington, Messrs. Parkinson of Birmingham, and other firms. The tank type is certainly the more convenient of the two and is obtainable in several very neat models, ranging in size from one which can be conveniently fitted over a lavatory basin to others designed for keeping at hand a dozen gallons or more of hot water.

* * *

Accelerating Hypo-Alum. By a coincidence there came into our hands almost simultaneously a few days ago the manuscript of the article by our contributor "Thermit," which appears on another page, and the December (1921) issue of the Kodak Abstract Bulletin containing a note on odourless sulphide toning. It will be noticed that "Thermit" ascribes a great advantage as regards acceleration of toning to the successive immersion of prints in hypo solution and then in one of sulphuric acid before transference to the ordinary hypo-alum bath. The report from the Eastman Laboratory describes a process which has been found practicable for sulphide toning, consisting in immersing prints first in 5 per cent. sulphuric acid for about 10 minutes, and then, after a brief rinse in 20 per cent. hypo solution saturated with borax, again for 10 minutes. Apparently, no heat is used, according to the Eastman process, the toning taking place, so we infer, chiefly in the subsequent half-hour's washing. Both writers ascribe the activity of the method to the formation of finely divided sulphur in contact with the silver image in the gelatine coating on the prints. Curiously enough, however, both writers appear to be unaware that a very similar method was advocated independently some years ago by MM. Lumière and Seyewetz ("B.J. Almanac," 1914, p. 660), and by Mr. H. Soar on page 662 of the same volume. MM. Lumière and Seyewetz used a mixture of hypo and dextrine to which hydrochloric acid was added imme-

diately before use. Mr. Soar immersed prints for about 20 minutes in a mixture of hypo and sulphuric acid. Both these earlier workers emphasised the fact that the sepia tone is obtained during the subsequent washing process. For commercial purposes this method has its drawbacks, and "Thermit's" present suggestion of employing the method as an accelerator of the ordinary hot hypo-alum toning bath appears to have advantages which are not possessed by the other variations of the process.

* * *

Pretty Negatives. It is rather a pity that it is impossible to establish any definite standard of quality for photographic negatives. We have, of course, the chemist's ideal of pure metallic silver embedded in pure gelatine, but unfortunately there are many negatives that do not answer to this description which yield most perfect prints. While pyro with ammonia or soda was universally used, the majority of negatives were not altogether pleasing to the eye, but they were usually of excellent printing quality. With the advent of the many non-staining reducing agents the visual quality of the negative improved, but often there was a distinct deterioration in the finished work. The principal difference is in the printing value of the shadow detail, which in an amidol- or metol-developed negative entirely depends upon the reduced silver, but which in the pyro-developed image is reinforced by the well-known yellow stain. Even if the clear portions of a pyro negative are colourless, there is a slight yellow stain under the image, and this has considerable light-resisting power. The obvious course for users of non-staining developers is to expose rather more, so that the weakness of the deposit in the shadows is overcome.

* * *

Unwanted Reduction. It is not recognised by all bromide printers that under certain conditions the acid fixing bath acts as a fairly powerful reducer, so much so that if a large number of prints from the same negative is made, and the first allowed to remain in the bath until the last is fixed, there will be much inequality in depth, although the exposure and development of all have been uniform. It seems that a large proportion of acid and the presence of developer carried in by the prints are the principal factors in producing this effect, so that the evil may be minimised by careful mixing of the solution and thorough rinsing of the prints. At the cost of a little extra work the prints may be preserved from over-fixing by following the old plan of numbering them on the back before exposure, and developing in the same order, it being then quite simple to remove the earlier ones from the fixer before they are spoiled. Another plan that has been worked successfully is to have two fixing baths, so that a certain number can be placed in each alternately, that is to say, two dozen prints, or fewer, are put into bath No. 1, and a like number into No. 2. As soon as No. 2 is filled the prints are taken out of No. 1, which, when filled, again gives the signal to empty No. 2, and so on.

* * *

Slow Papers and Warm Tones. There are now several developing papers with which warm black, if not actual dark brown, tones can be obtained by development alone without toning, but it is necessary that the special instructions given for exposure and toning be exactly followed. It is too much to expect that a special paper will give the best tones with any developer which the photographer happens to be using. The makers of one brand of paper direct that the exposure be adjusted so that development is complete in two minutes. This we have found cannot be disregarded with impunity. As there is, unfortunately, no standard of speed in bromide papers, many printers do not realise the great length of exposure necessary to get rich prints with warm tones. A recent experiment showed that a hundred times the exposure which was sufficient for a well-known bromide paper was just right for the warm-toned one. It is obviously necessary to provide a much more powerful light for exposing if much work has to be done, especially if vigorous negatives which yield the best results are being printed from. The smaller half-watt lamps come in handily for this.

MORE BUSINESS IN PORTRAITS.

In common with many other businesses not concerned with the necessities of life the circumstances of the time, as is hardly necessary to point out, have pressed and continue to press severely upon photographic studios. There is no doubt that the pressure is most heavily felt by firms in the industrial districts where unemployment among the working classes is more acute. Among studios whose customers are found among the well-to-do, many of whom remain prosperous under the present bad industrial conditions, the present depression is by no means so pronounced. Nevertheless, those who cater for the most fashionable and wealthy are doubtless making comparisons between their present turnover and that of the boom period preceding and succeeding the date of the Armistice. As regards these experiences it is worth while to recall the maxim that the time when conditions are bad is pre-eminently the time for consideration of new methods by which things can be permanently improved. While some of the symptoms of the present depression cannot possibly be remedied, except by removal of the causes, in particular the crucial handicaps of unemployment and excessive taxation, one cannot see any evidence of effort on the part of photographers to stimulate business during the depressed period. The usual argument is: "Times are bad; there is a slump; photography is a luxury, and must necessarily be one of the first businesses to suffer. It is inevitable, and we must put up with it."

The people who supply gramophones, pianos, and other musical instruments; furs, feathers, hats and fancy clothing of all kinds; pictures, books, motor-cars, bicycles, and numerous other articles, are all engaged in providing luxuries. All these people have suffered during the quiet time. They would, however, have suffered a great deal more—and many of them would have gone into bankruptcy—if they had shown no more enterprise and no more energy and foresight than many professional photographers have shown.

It is a good plan to watch what your competitors are doing. Every professional photographer ought to ask himself the question: "Who are my competitors?" Too often he looks upon the other two or three photographers in the town as his only rivals, whereas his real competitors are the people engaged in the trades just mentioned—the trades that are kept going entirely by the spare cash of the public. When you compare the efforts of these people with the efforts of the professional photographer, it is easy to see why photography has suffered to a much greater extent than other luxury trades. What is the remedy? What can photographers do to increase business? The answer is: Let them watch their competitors

The average citizen cannot take up his daily paper or his monthly magazine; cannot, indeed, walk along the street without having a hundred suggestions put to him for getting rid of his spare cash. He is told that he ought to make his home more cheerful by treating himself and his family to a piano, or some other musical instrument. A hint is thrown out to him that he is missing

one of the greatest pleasures of life by not being able to spend his week-ends driving round the country in a motor-car. He is also reminded that, to ensure the harmony of his household, he ought occasionally to treat his wife to a new hat. Rarely, however, is there anything to remind him that either he, his wife, or his children should have their photographs taken.

Now and again a photographer has put an advertisement in a local paper or sent out a few circulars to selected residents in his district, but notwithstanding this, it may be said with absolute truthfulness that professional photographers as a whole have done nothing whatever to popularise photography or to stimulate the demand for portraits. As a matter of fact, the person who has his portrait taken to-day must be in dead earnest; it must be an experienced need on his part, because certainly professional photographers in concert have done nothing to persuade him.

What is wanted is this—advertising to increase the volume of business—not one man advertising his own particular studio and saying nothing more effective than that he makes better portraits than somebody else. The interest in portraiture should be stimulated, and then every photographer would benefit. The value of co-operative advertising is now being realised by practically every trade. It is a remarkable testimony to the value of such a scheme that in America the Eastman Kodak Company spend a huge sum every year on advertising portraiture in the national Press, while their only means of getting a return for this expenditure is in the increased amount of material sold to professional photographers.

Here, the gas companies have combined to advertise gas; the Scottish wool firms have combined to advertise Scottish wool; the Irish linen manufacturers have combined to advertise Irish linen, and the makers of various other products are following suit. Co-operative advertising has been tried and the result has been a tremendous success. The same method could be applied to professional photography with hopes of even greater success, because the ground is new and has never been touched by national advertising. It would be a fairly safe prophecy to say that, if every professional in the British Isles would subscribe £5 a year to a fund for advertising photography to the public, the volume of photographic business could be doubled in the first twelve months.

SUGGESTIONS FOR PORTRAIT PHOTOGRAPHY.

In posing the sitter for a portrait it is well to always remember that people seldom sit bolt upright, "at attention," except when conscious of being under observation; that is, to put it another way, they always incline the body more or less and tilt the head at various angles, and frequently (not always) assume postures of ease and grace. If you cultivate the habit of acute observation you will come to see all these things unconsciously, and you will discover that it is easy to *find poses* that command admiration and insure the satisfaction of your clientele.

Watch people in public places, in carriages, tramcars, omnibuses, and particularly groups of people on the street or elsewhere engaged in conversation. They are at ease. They are not conscious of being observed. There are no squared shoulders, protruding chins and a military stiffness of neck and head—but, speak to a person, and notice the self-conscious rigidity and lack of reposeful grace that instantly follows.

Hence I suggest in posing people for portraiture, avoid the rigidity and stiffness, or the outward appearance of it. Let your sitter be at ease, and if you are keenly observant you will find very little to change. Perhaps a wrinkle in a garment, a hand to be moved or turned to improve a line, or a slight turn of the head may be necessary.

I constantly remind my sitters that the head is almost universally and unconsciously carried on one side. I am obliged to do this because many, especially ladies, fear that an inclination of the head will produce an affected look in their portraits. The reverse is true. That "picture look" goes with rigidity; and conversely the slight inclinations of the head and body impart naturalness and grace. Likewise, when people are interested they tip the head. It makes for repose and ease, invariably, and furthermore, strange as it may seem, it indicates alertness and interest on the part of the subject when animated by the proper expression. So I repeat, always incline the head a trifle in finding the pose. Observe in passing that I say "find the pose." This is important. Seldom should it be necessary to "make" the pose. On the contrary it should nearly always be "found" by letting sitters move themselves. Never, hardly ever, touch the sitter's head. They resist, and stiffness results. Stand by your camera, where you can see the effect, and suggest, indicating sometimes by your own movements, and the sitter will readily fall into a satisfactory pose. This inclination of the head is just as requisite in a three-quarter face or a profile view as when the head is turned full upon the camera. A valuable lesson in head posing is to be found in the work of the ancient Greek sculptors. There exists a mask—sometimes called the "Mask of Diana"—that is a safe guide for nearly all head posing. This mask can be purchased at a moderate price in most plaster cast shops. When viewed from the front of the face, the oval outlines of the head of the mask flow uninterruptedly into those of the neck and shoulders, producing that absolute essential, the *swirl* or line of beauty. I have always maintained that no grace can exist in a head pose or in a figure, or groups of figures, unless the fundamental line (which often is invisible), is the S curve or the "line of beauty," as it is almost universally known. The masterpieces of figure composition proclaim this fact; and this is quite as true in sculpture as in painting—or in good draughtsmanship everywhere. You will observe it in the well-known figure called the Venus de Milo; also in the headless and majestic Victory which graces and dominates the grand staircase of the sculpture gallery of the Louvre in

The Mask of Diana

Paris. I mention these two famous art works because they are so well known, and because reduced copies in plaster are so cheap and available as studies. I recommend to all portrait photographers that they buy casts of these three works mentioned above—the Mask of Diana and the two figures—and keep them at hand for daily observation. It is a wise thing to have good casts always under one's immediate observation. To live with them assists in the study of lines; and the more familiar one becomes with the lines of grace as exemplified by these famous works, the easier it will be to discover the needed lines of beauty in the sitter for a photographic portrait. The line of beauty adds a note of charm wherever it is introduced. It should be the basic line of the figure, the returns being shown in the head at one end and the feet at the other. Let the arms repeat the line, or let some drapery or fold continue the arm line, completing it in a curve of beauty. The more this is observed the more one is surprised at its prevalence and repetition in all beautiful figure arrangements; and yet it is still more surprising to realise the ignorance of the average photographer regarding this underlying note of grace and beauty. It is a revelation to many when the line is pointed out. It is so easy to see after a little study, and so easy to introduce into a photographic portrait. Often a piece of drapery can be made to contribute the effect, even when stiff and formal garments do not readily lend themselves to its achievement.

However, the figure can nearly always be so disposed as to produce the desired effect; and having accomplished that much, little touches of the return curve are easily added and introduced. Teachers of art, I find, do not always realise the needed stress upon this feeling of grace. I remember once, when lecturing in Boston upon the attainment of grace in posing the figure, a young man, a photographer who was operating in a large studio, came to me afterwards at my hotel, and thanked me for the valuable instruction he had received. He said that he had studied at the New York Art League, and had been a constant visitor at the Metropolitan Museum of Art, and up to the time of my exposition of the line of beauty, he had never really understood what made a figure picture graceful. He could recognise the grace, and see the beauty, but he was unable to resolve the composition into its fundamental lines of beauty, so as to reintroduce them in a dissimilar composition. "But," he added, "you have made it clear to me now. I can see the lines, and I realise what to do to get them into the picture."

I therefore re-affirm that all great pictures, sculptures, and figure arrangements that are pleasing and delight the eye, are built upon the line of beauty. One does not need to go far to substantiate this statement. Look at the great picture by Guido Reni, "Aurora," so widely known for centuries. Almost universally the lines of its compositon are swirls—the S curve. Observe, if you will, Raphael's Madonna of the Chair. The magic of the composition is the marvellous way the painter has arranged his swirling lines—all of the kind that I am insisting upon. The face might be still more beautiful, but without the grace of line the picture would be deficient in charm. Take Bouguereau's famous works—which exhibit some of the most beautiful female figures ever put upon canvas—and you will find this delightful curve prevailing, even predominating. I could adduce thousands of instances in pictures that are world known. Boucher, the French master, was a disciple of the return curve, and few more elegant examples of perfect drawing, combined with exquisite colour and delicacy, exist. Fragonard even caused his trees to continue the lines of his figure arrangements, and they invariably terminated in the swirl. The works of these two famous French painters will richly repay study.

I again suggest to those who would increase their ability to make simple, natural, graceful poses for their patrons, to surround themselves with examples of good figure arrangements. There are other considerations besides self-instruction to be weighed in purchasing casts and good examples of the painter's art, and displayng them in one's studio. Your patrons judge your taste largely by what you permit them to see in evidence. If your reception room, dressing-rooms and light room are adorned only with a collection of portrait photographs, mostly of one small or moderate size, they are not likely to place your artistic standard very high. If, on the other hand, you display on your walls masterpieces of art—not merely photographs, unless they are high-grade carbon prints—their estimation of your taste will certainly be a higher one. Let me cite an instance. Among my artist friends in New York City is a young woman who is rapidly becoming a distinguished sculptor of world-wide renown. Only last year she was honoured by a purchase by the French Government of a bronze group, nearly life-size, which was erected under her supervision in the Jardin de Luxembourg in Paris. This is a most distinguished honour. The entrance passage-way to her studio is adorned with bas-reliefs by Michaelangelo, Della Robbia, and other renowned masters; and there are also many photographs of great works displayed for the visitor's inspection as he proceeds towards her lofty and beautiful studio. The impression is a subtle and masterly one. You feel that you are being ushered into the presence of an artist of rare taste, discrimination and great attainments. Everyone knows that a first impression is the one that invariably endures. Why not set the stage in our own studios as carefully and with as certain effect? It can be done. The results of such a display will impress your clients, and will also react upon you, the photographer, for it will inspire you and increase your appreciative powers, thus benefiting your work in portraiture. Patrons will have more confidence in your ability as an artist, which is certainly a consummation devoutly to be wished. The psychology of this idea is well known and appreciated by many successful workers in all branches of art. The greatest designer of architectural ornament I know in America is surrounded by, in his home and studio, replicas and photographs of the world's most beautiful works of art. These are his constant source of inspiration. His mind is saturated with the achievements of those who have trod his chosen pathway before him. The great artist, Alma Tadema, who devoted himself to figure paintings representing the beautiful mythology of Greece, lived in a home in St. John's Wood, London, that was a veritable Grecian temple. Its architecture and adornments appear in many of his canvases. This should be an object lesson for all of us who are devoting our lives to portraying the human figure.

Much of the facility in hand posing which the writer possesses has been acquired by the study of good sculpture. Many a lesson have I received from the works of Michaelangelo. Though he has been dead hundreds of years, his masterpieces remain and teach us, if we will but observe. Copies of good works of art are so accessible, even in the smallest towns, that there is no excuse for ignorance upon these subjects. The public libraries are full of books that demonstrate these theories of mine, which are the fundamentals of art; the "Perry pictures," little prints in half-tone selling at a half-penny each, are available; and the little pocket-size booklets published in London, each devoted to a master painter and his works, are to be had at prices within the reach of the leanest purse. Let me urge those who desire to progress to think of these things that are worth while; and it must be apparent to the dullest mind that the reward of study is to be found in the appreciation of one's patrons, and with it an increasing income.

You will find that artists like Rembrandt could not paint without introducing the line of beauty. His Holy Family and his many portraits of himself are pregnant with the lines. Do not imagine that this curve is only for women and children. It serves as faithfully in men's portraits, and unfailingly, too. There is no royal road to learning. This age-old adage applies most forcibly to art in photography, and there is no return more certain than the benefits to be derived from learn

ing to see, which is only another way of learning to draw; and one can draw with the camera as surely and as definitely as the painter with his brush. No one can produce beautiful things who cannot first envisage them. Innes, the famous landscapist, said: "You can do nothing in Art unless you have intuitions; but between whiles you must work hard in collecting the materials out of which 'intuitions' are made."

CHARLES H. DAVIS.

PORTRAITS FOR COLOURING.

THE "Ex Cathedra" paragraph, "Portraits for Colouring,"* was, doubtless, prompted by the realisation that too much colour work is being attempted on prints which are unsuitable. Although a good deal has been written concerning water-colour finishing it is apparent that various authors have given very slight advice on the production of a suitable print.

It is true to remark that print-requirements of individual colourists vary according to circumstances, and the chief of these circumstances are: The personal ability of the artist, the "style" in which the picture is to be finished; the price the work is to command, and the time allotted to it. Therefore, taking these factors into consideration, it will be realised that the *ideal* print, to suit all conditions, cannot be defined in an arbitrary manner; however, it is possible to give helpful, practical suggestions, and it is hoped thereby to fill a breach which hitherto has existed.

The Charm of Water-Colour.

If we examine the technique of water-colour painting it must be realised that the charm of this medium of expression is chiefly distinguished by its purity, transparency, and delicacy of colour; these characteristics, however, are not imparted without knowledge and experience. The artist is extremely particular in his choice of a suitable water-colour paper; in its care and use; the thorough cleanliness of his brushes, palette, and colours, together with their correct mixing and application.

To a great extent depth, or richness of effect, is attained by colour opposition, or "colour-contrast," and is not necessarily due to contrasts of light and shade; moreover, the beautiful white paper base, almost universally used, ensures pure colour with practically no appreciable alteration after application, for it is the more or less transparent properties of water-colour tints, in conjunction with a suitable base, that render such colours in all their purity and luminosity.

Comparisons.

The technique which we have considered applies to the colouring of a portrait photograph; the photographic print, however, introduces a new element, and that element has to be examined in combination with colour practice. In photography, pure and simple, we generally find a certain amount of contrast of light and shade essential in order to attain a measure of relief and solidity. Since, in colour work, this contrast is largely obtainable by means of colour opposition, monochrome contrast is not essentially so marked in a portrait which is to be coloured—in fact a rather light print, of a suitable tone, correct in tone-values and possessing but delicate contrasts, materially assists in attainment of colour purity, transparency and truthful harmony throughout the subject.

An Unsound Practice.

Regarding colour finishing as a higher branch it must become evident that the procedure ordinarily adopted in making a negative—on a colour-blind plate—does not always comply with the requirements which the foregoing implies; and, as it often happens that a coloured portrait is ordered from a negative already *so* made, it is no exaggeration to assert that this is the most prolific source of indifferent colour work.

In such cases it is true to say that "faking" may be resorted to; and if the end justifies the means there cannot be much objection. But it is neither so desirable—nor so sound in procedure—as the more direct method of arranging special sittings for work which is to be coloured. Therefore, in going to the root of the subject, it is considered that the matter will be of greater utility.

Personal.

Whether applied colour should be subordinated to the photographic basis, or *vice versa*, is perhaps a moot point. Personally, and regardless of purist opinion, I believe in the elimination of the photographic to the utmost practical extent in order that the finished work may, as nearly as possible, have the charm of the true water-colour; it is with this end in view that I much prefer to arrange a sitting for coloured orders.

Special Sittings.

Those who can turn out good coloured work, work rather above the average, will soon find that it is not so difficult to book a direct sitting for a colour portrait. Moreover, such sittings, being designed for the special purpose, are of benefit to sitter and photographer alike. Therefore, if any reputation is thought desirable one must specialise in this as in any other branch and the work must be planned in accordance with its special needs.

It has been stated that a *sine qua non* of good work is correct tonal, or colour rendering *in the negative*. In a good studio it often happens that a fair proportion of sitters are portrayed in fancy dress. These dresses can be, and usually are, composed of more or less gay colours, and, in addition, the subject's personal colouring is a variable factor. In these circumstances the ordinary plate and correct tone values do not often go hand-in-hand.

If the full advantages of a specially arranged sitting are to be ensured, the operator must be prepared to employ panchromatic plates, preferably with a suitable light-filter, in every case where the ordinary plate is likely to prove unequal to the task of correct colour translation. The employment of panchromatics is the one sound, direct method; the alternative is faking, which is undoubtedly, the less satisfactory and more troublesome procedure. Therefore, the adoption of the panchromatic is a long step towards trouble free, able workmanship.

In the Studio: Backgrounds.

Having arrived at this point we may consider the further formulation of practice suited to the desired end. In dealing with the subject of background, I will use a story which has a moral. I cannot recall the actual words, but I give them in effect. A father took his son to one of the old masters with a view to being apprenticed to learn portrait painting. In the interview the parent suggested the boy might be useful to the artist in painting in the backgrounds to his pictures. "In that case," said the master, "I have nothing to teach him."

The moral is obvious: the background, it is true, should be subservient, or secondary, to the subject proper; but this acknowledgment does not preclude the colouring, or composition, of the portrait being materially benefited by well considered judgment and the able execution of its background.

I have already remarked on the desirability of cutting out

* "B.J.," "Ex Cathedra," December 30, 1921.

the photographic to a great extent; if it is remembered that the painted scenic ground is not held in particularly high esteem in ordinary photography it should be apparent that its inclusion in a coloured portrait may constitute a mark of mediocrity. Therefore, in photographing a sitter for colour finishing, it is my invariable custom to use a white background—such as is commonly used for sketch portraiture; the ultimate clean, white base is a valuable acquirement to the colourist who has *carte blanche* in the matter of background finishing. Such a basis permits every possibility; it allows the skilled artist unrestricted scope without excluding the less skilled from finishing in a style less ambitious or masterly; the work may be carried to the margins in the solid style or it may be done as a vignette.

On the whole, the plain white ground answers so eminently well that any other is scarce worth consideration; any such consideration would assist in reducing the force of the plea for special sittings.

Lighting.

Contrast of light and shade is fatal; the lighting should be arranged in a higher key free from any suspicion of heavy shades; much the same kind of effect as has been recommended for sketch portraiture, *delicate, luminous shadows,* coupled with a full exposure and soft developing, materially assisting in the expression of those qualities so essential in good water-colour work.

The Basis.

Sufficient has been remarked to assist in the making of a negative, or the selection of an existing negative, which experience has taught to be most suitable from which to make a photographic basis for water-colour finishing; the basis or print, therefore, may now have attention.

Apart from small work and the superior permanency of carbon and platinotype, I do not consider the process of printing of great importance, particularly in view of the increasing use of the air-brush—for large areas of colour, at least. In point of fact, the process is often decided for the colourist, and for work of any size it very frequently happens to be bromide. If the print in this process is thoroughly fixed in double fixing baths, sulphide-toned, and very carefully washed after every chemical application, there ought not to be any fear for its reasonable permanence, and anything injurious to colours should be non-existent.

The nature of the surface and tint of the paper are important, and require careful consideration. A white base permits the utmost transparency and purity of colour. Moreover, the colourist can attain, thereon, any effect of which cream, buff, or other of the tinted papers are capable, without the corresponding alteration of colours their use would entail. A cream base might make no appreciable difference, but deeper tints would certainly modify applied colour.

The degree of smoothness or grain of a paper is largely a personal matter, and usually varies suitably with the size of the work; although it is good advice to say that no paper should be used which bears a suggestion of emulsion sheen—in other words, a perfectly dead matt surface is much the best.

Further Considerations.

Assuming that the process of printing has been decided there remain a few considerations. The ability of the colourist, and the price which is being obtained, have a bearing on the production of a print suitable to particular cases.

The skilled artist, as a rule, much prefers a very light print of sepia tone. Such a print appears yellowish, lacks modelling in the most delicate passages, and is weak in its darker portions. While the pale basis gives the drawing of the subject the clean lights and delicate, luminous deeper tones facilitate that invaluable clarity and transparency of colour which is so desirable. Likeness, richness and effect depend very much on the colourist's able modelling and distribution of colour; nevertheless, in capable hands, this type of print results in the best colour work.

Obviously, with the one exception of painting without a basis, this may be regarded as the highest branch of finishing; one must have ability and a price in proportion to the work. If the ability, or the price, or both are not forthcoming the case has to be met by a modified print. This is brought about by rather heavier printing—a print in itself more complete as a likeness and a picture.

Therefore, the deeper the print is made the less strained is the skill of the colourist, but as this depth of basis increases so does the purity and vitality of applied colour decrease until a point is reached where the work becomes unskilled and mediocre, and the impression is formed that the "coloured" portrait would have been much superior had it been nicely finished as a monochrome.

If skill or price be not of the best it is advisable to adopt a middle course and so arrange the print as to record the modelling, which is vital to true likeness, together with a little more general depth throughout. This will give "body" without so much dependence on after work; in these circumstances the value of panchromatic colour translation becomes more apparent.

Conclusion.

The endeavour to secure a suitable, nicely-conditioned foundation for colouring, on the lines indicated, is sure to show well-considered deliberation; and if original and skilful finish is the praiseworthy aim, this end will be greatly assisted if the usual stock photographic mount is eschewed. Indeed, the portrait will be greatly enhanced if it be mounted and framed in one or other of the styles more suitably adapted to ordinary water-colour practice.

PRUDENCE.

PHOTOGRAPHIC ARRANGEMENTS FOR THE ROYAL WEDDING.—According to the present arrangements, only two cameras are to be allowed in Westminster Abbey on the occasion of the Royal wedding on February 28, and a chorus of protests is being raised against the regulation. The "Star" had a lengthy and well-written article on the subject:—Authorities in the photographic world with a wide experience of the difficulties of taking interior pictures of a massed ceremonial fully endorse these views. Such an authority as Mr. Banfield, of Messrs. Foulsham and Banfield, when asked to express his opinion, characterised the arrangements as the height of absurdity. In view of the importance of the occasion he considers that not fewer than 18 to 20 photographers will be required.

"I would station them in different parts of the building," he said. "Some should be placed aloft to secure a bird's-eye view of the ceremony; some should be close at hand to record minute details of dress and expression. Some ought to be working at either side, and others again from the back.

"And I think it equally important that one or two should be placed with their backs to the altar so that they can include the crowd of distinguished guests."

Mr. Walter Stoneman, of Messrs. Russell, Baker Street, also condemns the arrangements. "Provided that Press photographers will remain in their places," he declared, "I think it extremely desirable that at the very least four photographers should be admitted.

"Apart from the chances of one of the cameras failing, light is an important factor in interior work. One photographer may be suitably placed under a window where the light falls directly on his subject, but the second photographer may find himself in a dimly-lit corner, and fail to secure a single good picture."

Apparently the authorities are afraid that the impressiveness of the ceremony may be disturbed by a continual clicking of cameras. But that apprehension is groundless. The first-class instruments used by the Press to-day work so silently that a person standing within a few feet may not be aware that a photograph is being taken.

THE PRACTICAL STEREO PHOTOGRAPHY OF SMALL OBJECTS.

(*Continued from page* 65.)

It will be seen that the quantity n does not enter into the expressions (*a*) and (*b*) above. Having decided on the optical details of the stereoscope to be used, we can therefore tabulate *print width* and *image width* for various distances x of the stereo image, and these important values can be placed at the worker's disposal. This is done later on. The absence of n shows that the stereoscope does not make itself responsible for the *scale* of the image. This factor in the problem must therefore be introduced into the formulæ by means of the camera lens, to the consideration of which we now pass.

We can arrive at the focal length of the lens required by a convenient back-stairs method of approach, which has the advantage that it enables us to pick up two extremely useful formulæ on the way. If we multiply ratios 1 and 2 together we get: $\frac{\text{print width}}{\text{object width}} = \frac{nf}{x+f}$. Since we have determined that the negatives obtained in the camera are to be suitable for direct printing without magnification or reduction, the ratio just obtained may, for our present purposes, be written: $\frac{\text{negative width}}{\text{object width}} = \frac{nf}{x+f}$.

There is an optical principle, well known to all who use copying apparatus, that if a negative is to bear to the object photographed, say, the ratio m, the *camera extension*, or distance from lens to plate, must be $F(1+m)$, and the *object distance*, or distance from lens to object, must be $F\left(1+\frac{1}{m}\right)$, F being the focal length of the lens about to be used. The ratio m in this case has just been found to be $\frac{nf}{x+f}$. Putting this latter value in place of m we have the two working formulæ:—

(*d*) *Camera extension* $= F\left(1+\frac{nf}{x+f}\right)$.

(*e*) *Object distance* $= F\left(1+\frac{x+f}{nf}\right)$.

These perfectly general formulæ will work out accurately, no matter what may be the focal length of the lens used: and, since n and x are both now included, the distance and scale of the image will be correct. A very wide liberty is thus put in the photographer's hands if he is content with accuracy in these two particulars, as he can use any lens that at all approximates, or even that does not approximate at all, to the correct focal length. Only one lens, however, will render true *depth*, and give an image of perfect form. Depth distortion is not easy to detect unless it is extreme; and if the worker is disposed to commit photographic crimes in the expectation that he will not be found out, the way is open. It is hoped, however, that in such cases he will make confession of his fault, so that the blame may be placed in the proper quarter, and the good name of stereoscopy may not suffer.

It is obvious that the *object distance* given by formula (*e*) above will vary directly with F. But, as stated at the beginning of our present inquiry, the true *object distance* is $\frac{x}{n}$. We have only to equate these two values to find the exact F of which we are in search.

$$\text{Object distance} = F\left(1+\frac{x+f}{nf}\right) = \frac{x}{n}.$$

From which we deduce the formula: $F = \frac{xf}{x+(n+1)f}$.

All these formulæ contain nothing but the photographer's two variables x and n and the stereoscope constant f. If x is taken as some multiple of f they are quite simple in use. In any case, it is only a moment's work to put in the values and find the result.

The first thing we learn from the lens formula just obtained is that when x is finite F must always be less than f, or that it is useless to attempt to get accurate results with a camera lens whose focal length is equal to that of the stereoscope used. It is also seen that as n increases F becomes less, or that higher magnifications of the image require shorter lenses. This is one of the reasons why the stereoscope should not be of unduly short focus. When x is practically infinite, however, as in landscape photography, the formula reduces to the expression $F=f$, and shows that for this kind of work the camera lens and the stereoscope lens should both be of the same focal length.

It will, of course, be impossible to provide a lens of exactly correct length for every value of x and n, but practical accuracy over a wide range of values can be obtained without difficulty. Table I. below, giving values of x, n, and F, is drawn up on very conservative lines, being almost precise, and shows that each lens can cover a considerable group of results.

There still remains one last factor in the problem to be considered. What is to be the separation of the taking lenses, or the extent of the side shift to be given to the camera between the left and right exposures, in order to secure the correct degree of *perspective difference* between the left and the right prints. There is no doubt whatever that this separation or shift must vary inversely with n. The form of the expression laid down at the beginning of our inquiry—*lens separation* $= \frac{S}{n}$—belongs to the demonstrably accurate principles of the investigation. But what value is to be assigned to S? It has been most usefully pointed out that the separation of the eyes is less when looking at an image or object at 12 in. than when looking at infinity distance. In the one case the separation is 2.25 in.; in the other it is 2.5 or 2.6 in. The natural suggestion was made that the *lens separation* should also be less for small values of x, and should widen as the distance increases. There are some theoretical difficulties created by the fact that the eyes are not fixed points in the head, but move from side to side of their orbits as they look from left to right of the image. Nevertheless, the above suggestion, which was adopted by the writer, seems perfectly sound, and may be taken as the safest basis on which to work. The value of *eye separation* for various distances of the image is given in the fourth line of Table I. The figures are merely approximate, and are calculated on the only mathematical basis that presented itself, 2.6 in. being assumed as the infinity separation of the eyes. The worker, therefore, who is being extremely careful to be precise in estimating the value of $\frac{S}{n}$ may leave himself a little liberty as regards the decimal point. He will not be far astray, for higher values of x, as long as the S he works with is not less than that indicated in the Table and not greater than the infinity separation of 2.6 in.

The value of $\frac{S}{n}$ will be very small when n is great, and small errors will have a proportionately greater effect upon the result. On the other hand, when n is fractional, *i.e.*, when the image is to be on a reduced scale, the *lens separation* will become large, and a slight error will not be of importance. In every case care must be taken that no lateral movement is given to the camera. The result of such movement is to make height measurements in the two prints no longer coincide, and to introduce a kind of inaccuracy that is painful to the eyes. In taking the left and right negatives the lens axes must be kept strictly parallel.

We have now reached the end of our inquiry, so far as concerns the problems peculiar to stereo work; but this article would be incomplete as an attempted practical guide if it omitted to consider the depth of focus, or degree of definition obtainable in points of the image lying at given distance before and behind the plane of *image distance* (which we may call the principal plane) in any given case. What stop must be used to secure sharp focus over any desired depth of the image, and what time of exposure will be

necessary? The question becomes pressing for high magnifications at short distances, i.e., when n is large and x small; but the difficulty that then arises is only the ordinary difficulty that attends the photography of solid objects on a scale considerably greater than that of Nature. Stereo photography introduces no new element here and adds nothing to this difficulty. As a definition of what is meant by sharp focus we may adopt the convention that an image at 12 in. is in critically sharp focus when points are represented by diffusion circles of not more than 1/100 in. in diameter, and that as the distance of the image increases the diffusion diameter may also increase proportionately, so that at 24 in., for instance, this diameter may be 1/50 in. This sensible practical convention is generally recognised as theoretically correct. The degree of sharpness it demands is so high that considerably greater diffusion may exist in the more distant points of the image without noticeably injuring definition.

A 1 in. depth of focus also means more than at first appears, since it is 1 in. at each side of the principal plane. A total depth of 3 or even 4 in. will then be in reasonably sharp focus all over if 1 in. of this is on the nearer side of the principal plane and the other 2 or 3 in. on the farther side. The rule will be that to secure critical sharpness as defined above over any given depth d of the image—say for a distance of 1 in. before and behind the principal plane—the effective diameter of the stop used (not its F number) must vary inversely with n and d and directly with x^2. If we double n or d we must halve the stop diameter and increase the exposure four times; if we double x the stop may be four times as wide and the exposure becomes immensely less, though not exactly in proportion to the square of the stop diameter. If we increase x, n, and d proportionately together, i.e., if we magnify the image and project it to a correspondingly greater distance no change will be made as regards the stop diameter, but the exposure will be somewhat lengthened. It follows that for high values of n at 12 or 16 in. either an extremely small stop must be used, involving prolonged exposure, or only a small depth of the image will have sharp definition. For a 1 in. depth of focus pin-hole apertures would be required for the magnifications of 8 and 10 at 12 in. set down near the bottom of Table 1, the stop diameters being respectively .015 and .012. The magnification of 10 at 16 in. would require a stop diameter of .021 for the same depth of focus.

We may give three formidable-looking, but really simple formulæ that will enable the exact scientific worker to calculate in every case the aperture and relative exposure required. It will be seen that here, again, nothing enters into these expressions except the photographer's x and n, and the stereoscope constant f. d represents the required depth or distance of critical sharpness, before *and* behind the principal plane of the image. If this distance is 1 in. on each side of the plane then $d = 1$. It must be kept in mind that a distance d of the image will be represented by a distance $\frac{d}{n}$ of the object. No point of the object should therefore project to a distance of more than $\frac{d}{n}$ at the nearer side of the verticals.

The formulæ as given below are adapted for use in connection with magnified images at short distances, and in all cases where d is small compared with x. When d is taken as an important fraction of x, as may be done in reduced images or in natural size images at a greater distance, the more precise formulæ given in Table II. must be used.

$$\text{Diameter of stop} = \frac{x}{1200} \times \frac{x}{n} \times \frac{1}{d}$$

$$F \text{ number of stop} = nd \times \frac{1200}{x} \times \frac{1}{x + n + 1}{f}$$

$$\text{Effective } F \text{ number of stop} = nd \times \frac{1200}{x} \times \frac{1}{x + 1}{f}$$

We take a simple example to illustrate the meaning of the above terms. An image, viewed through the standard stereoscope, is to be natural size at a distance of 12 in., and is to be critically sharp to a depth of 1 in. Then we have $x=12$, $n=1$, $f=4$, $d=1$. Putting these values in, we find: Diameter of stop = 0.12 in.; F number of stop = 20; effective F number of stop = 25. The stop used will be numbered $F/20$, but the exposure must be calculated on the basis of $F/25$. It is important to notice that these F numbers need not vary, whether the lens used is of correct focal length or not.

(To be concluded.) H. C. BROWNE.

ACCELERATING THE HYPO-ALUM TONING BATH.

ONE of the troubles known to bromide printers is the slowness of action which is often exhibited by hypo-alum. True, this is not one of those things which are regular and unalterable. It is possible, and in places common, for the process to be carried out rapidly and without delay, day after day, but in many cases the length of time taken up by toning is much more than it need be, and in few cases could one guarantee beforehand that only a few minutes would be so absorbed.

At a time when I personally handled large batches, I often found myself going home on the 8.30 when I should have been on the 6.15, merely because the toning bath had displayed a persistent reluctance to get going, or having got going, had been so slow in carrying on. Naturally, this gave me to think, but at the time I could devise no remedy. Recently, my attention was called to a case of slow toning which was unusually slow, and having a few moments to spare, I put to test a theory that I had evolved previously.

In the case in point, the bath was fairly good and was at a sufficiently high temperature, nevertheless the prints, a dozen half-plates, had stood it for an hour without sign of change. Leaving them in, with the heat still on, I prepared two dishes of solution and collected a comprehensive pile of old black and white prints from the waste bag. Some were bromide, some gaslight; some over- and some under-exposed. One of the solutions was plain saturated hypo; the other, sulphuric acid of a strength of 1 in 14. I do not say either of these is ideal for the purpose; they were experimental. I soaked the old prints in the hypo until limp and then transferred them to the acid, turning each over for a couple of minutes in order to give the acid opportunity to penetrate the hypo-laden gelatine everywhere. In neither dish was the action carried on to the point of reduction of the image. From the acid bath, after a slight rinse, the prints were transferred to the hot toning bath where they toned out a good sepia in about three minutes, being fully toned and in the wash-water when the half-plate prints were just starting to turn colour.

Apparently my theory was sound, though I have other trials and experiments in view to support and prove it, if possible. My idea was this. I knew that the toning depended on the action of the precipitated sulphur in the bath, and that before this could act it had to come in contact with the silver. That its action was not reluctant I knew by the state of silver coins in my trouser pockets in the days when I constantly handled the stuff. Therefore, something must obstruct, and as sulphur is not soluble, what more likely to obstruct its passage to the silver than gelatine. I had noticed that when prints were fixed in a fresh mixture of hypo and alum without acid (a very dubious fixing bath for anything but prints for toning) they were apt to tone rapidly, and that when some prints were experimentally put through a sulphuric stop bath, they toned themselves after fixing. This could only be due to sulphur in the gelatine.

By soaking prints with hypo, sulphur (in soluble combination) is put into contact with the silver, in the structure of the gelatine. When the hypo is met by sulphuric acid, sulphur is precipitated in a nascent form and still in contact with the silver. Hence the expectation of rapid toning on the application of heat.

In practice, it would seem easier to transfer prints straight from the fixing bath to the acid, and if the fixer was plain hypo this would be all right, but in the case of the numerous compound fixing baths other actions might take place. Thorough washing, however, should not be necessary at any stage. After immersion in acid it might be that hot water would finish the action, but this would be risky to the gelatine, and if sufficient sulphur had not been precipitated in the film the action would stop short. With the process as I have described it, it is feasible to suppose that the sulphurisation by the "internally precipitated" sulphur may make way for the action of sulphur in the hypo-alum solution, and thus the two together complete the toning. In any case, as far as I have gone, the action is decidedly more rapid when precipitation has taken place in the film itself.

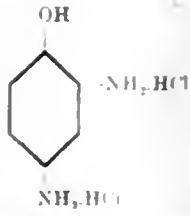
Whether the hypo and sulphuric baths prevent "staining"—the appearance of blue-black patches which refuse to tone—or not, I cannot say. I am awaiting a stained print to see what the double immersion will do. If such staining is due to "cooked" gelatine, as some have asserted, it may be that hypo-alum cannot work purely on account of inability of the sulphur to penetrate the cooked parts of the film, in which case internal precipitation would soon wipe off the "stains," and incidentally save much temper. THERMIT.

THE STABILISING OF SOLUTIONS OF AMIDOL.

PHENOLIC bodies containing two or more hydroxyl groups in the molecule very readily oxidise in alkaline solution. Thus pyrogallol dissolved in dilute sodium or potassium hydrate solution rapidly absorbs oxygen from the air and becomes very dark brown owing to the formation of a deep-coloured dyestuff.

With the mild alkalis like sodium carbonate this action is much less rapid, but still takes place. The tendency to darken and thus become useless from a photographic point of view, is generally overcome by making a stock solution of pyrogallol, and only adding the alkali immediately before use.

Amidol, which is a di-hydrochloride having the formula :—



needs no alkali for it to act as a developer, and thus the problem of stabilising this substance is simple.

According to Bunel (Bull. Soc. Franç. Phot., 1921, *8*, 290), a small amount of lactic acid considerably reduces the rate of oxidation of amidol in air, and does not affect its developing power. The amidol solution he used was the usual one, namely.

Amidol	...	5 grams
Anhydrous sodium sulphite	...	30 grams
Water to	...	1,000 c.c.

To this 5 c.c. of lactic acid of specific gravity 1.21 was added. After seven weeks the solution showed scarcely any colour, although the bottle had been periodically opened for use. Glycerine, which retards the oxidation of sulphites, might be expected to behave similarly to lactic acid towards the oxidation of amidol, but here it shows no retarding influence. According to Bunel, glyceric acid acts in the same way as lactic acid.

The reason for this is probably a structural one. The graphic formulæ of these three substances are

CH_2OH	CH_2OH	CH_3
$CH.OH$	$CH.OH$	$CH.OH$
CH_2OH	$COOH$	$COOH$
Glycerine.	Glyceric acid	Lactic acid

Desalme (Rev. Franç. de Phot., 1921, *2*, 128) has used a solution which he terms "stannous tartrate" for stabilising amidol solutions.

The "stannous tartrate" solution was made by dissolving 5 grams of stannous chloride and 7 grams of tartaric acid in 30 to 40 c.c. of water. This solution was added to one containing 30 grams of sodium carbonate crystals in 30 c.c. of water. The total volume was made up to 100 c.c. This solution is stated to have no action on silver bromide or on the latent image. For use with amidol it is first acidified with sodium bisulphite, but this worker does not specify the quantity of the bisulphite to be added.

Lobell (Bull. Soc. Franç. Phot., 1921, *8*, 291) has compared the efficiency of Bunel's and Desalme's solutions for stabilising amidol developers by means of the Eder Hecht sensitometer, using bromide paper of constant exposure. Development was always sufficiently prolonged to reach γ^{∞}. It was found that the developing power is retained approximately twice as long in developer containing either stabiliser, as in the ordinary amidol developer.

It is now found, however, that amidol prepared from 2 : 4 dinitro-phenol by reduction with tin and hydrochloric acid already contains small quantities of tin chloride, and thus in solution with sodium sulphite contains its own stabiliser. Advantage has been taken of this fact in a Provisional Patent Specification (No. 2,070).

The reaction involved in the reduction of 2 : 4-dinitro-phenol to the diamino-compound may be expressed :—

$$HO.C_6H_3(NO_2)_2 + 4Sn + 16HCl =$$
$$HO.C_6H_3(NH_2)_2 + 4SnCl_4 + 4H_2O.$$

The amidol so formed could unite with the stannic chloride simultaneously produced. If excess of tin be employed in the reaction, stannous chloride would be produced instead of stannic chloride : thus :—

$$HO.C_6H_3(NH_2) + 8SnCl_2 + 4HCl + 4H_2O.$$
$$HO.C_6H_3(NH_2) + 8SnCl_2 + 4H_2O.$$

Stannous chloride, like stannic chloride, could form a double salt with amidol. These double compounds have the formulæ :—

$HO.C_6H_3(NH_2)_2$, H_2SnCl_4,

Amidol stannochloride, and

$HO.C_6H_3(NH_2)_2$, H_2SnCl_6,

Amidol stannichloride.

A developer made up from amidol containing amidol stannochloride (only a trace) has shown excellent keeping qualities. No darkening has occurred at present after the lapse of five months.

J. G. F. DRUCE, M.Sc., A.I.C.

FORTHCOMING EXHIBITIONS

February 7 to 11.—Sheffield Photographic Society. Particulars from the Hon. Secretary, James R. Wigfull, 14, Parade Chambers, Sheffield.

February 11 to 25.—Scottish Photographic Salon. Particulars from the Secretary, James F. Smellie, Braefindon, Allanshaw Street, Hamilton.

February 14 to 17.—Exeter Camera Club. Particulars from C. Beauchamp Hall, Hon. Exhibition Secretary, Exeter Camera Club, "St. Denys," Bellevue Road, Exmouth.

February 18 to March 3.—Edinburgh Photographic Society. Particulars from the Hon. Secretary, G. Massie, 10, Hart Street, Edinburgh.

March 1 to 6.—Birmingham Photographic Society. Latest dates: Entry forms, February 15; exhibits, February 23. Particulars from the Hon. Secretary, P. Docker, Medical Institute Buildings, Edmund Street, Birmingham.

March 4 to 25.—South London Photographic Society. Particulars from the Hon. Secretary, Harry Abbott, 61, Beauval Road, East Dulwich, London, S.E.22.

March 8 to 9.—Birkenhead Photographic Association. Latest date for entries, February 25. Particulars from the Exhibition Secretaries, Messrs. Longstaff and Trace, 33, Hamilton Square, Birkenhead.

March 14 to 16.—City of London and Cripplegate Photographic Society. Latest date for entries, March 4. Particulars from the Hon. Secretary, J. J. Butler, 7, Gresham Street, London, E.C.2.

March 15 to 20.—Welsh Salon of Photography. Latest date for entries, March 9. Particulars from the Secretary, H. G. Daniel, 154, Penylan Road, Cardiff.

March 16 to 18.—Leytonstone and Wanstead Camera Club. Latest date for entries, February 28. Particulars from the Secretary, S. W. Liddell, 20, Fillebrook Road, Leytonstone, E.11.

March 27 to April 3.—Dennistoun Amateur Photographic Association. Latest date for entries, March 11. Particulars from the Exhibition Secretary, Colin Graham, 448, Duke Street, Dennistoun, Glasgow.

March 28 to April 1.—Hackney Photographic Society. Hon. Secretary, Walter Scott, 24, Pembury Road, Clapton, London, E.5.

April 5 to 8.—Leicester and Leicestershire Photographic Society. Latest date for entries, March 22. Particulars from the Hon. Secretary, W. Bailey, Cank Street, Leicester.

April 21 to May 11.—Hammersmith Hampshire House Photographic Society. Latest date for entries, March 30. Particulars from the Hon. Exhibition Secretary, J. Ainger Hall, 20, Bishop's Mansions, Bishop's Park Road, London, S.W.6.

May 1 to 6.—Photographic Fair, Horticultural Hall, Westminster. Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1.

September 15 to October 28.—Royal Photographic Society. Latest date for entries to carrier, August 25. Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

A PHOTOGRAPHER'S WILL.—Among the wills proved last week was that of Mr. Charles W. Burrows, of Fitzroy Street, St. Pancras, who died on December 24 last, £10,156.

Patent News.

Process patents—applications and specifications—are treated in "Photo Mechanical Notes."

Applications January 23 to 28 :—

DAYLIGHT DEVELOPMENT.—No. 1,961. Daylight developing-tank for photographic films. F. H. Ibbetson.

SHUTTERS.—No. 2,485. Combined roller-blind and focal-plane photographic shutter. W. H. Lambert.

TELEPHOTOGRAPHY.—No. 2,212. Telephotography. D. Mihály.

PHOTO-MICROGRAPHY.—No. 2,502. Photo-micrographic apparatus. M. T. Denne.

STEREOSCOPY.—No. 2,381. Method of producing stereoscopic phenomena and eliminating distortion in optically projected pictures T. E. R. Phillips.

COMPLETE SPECIFICATIONS ACCEPTED.

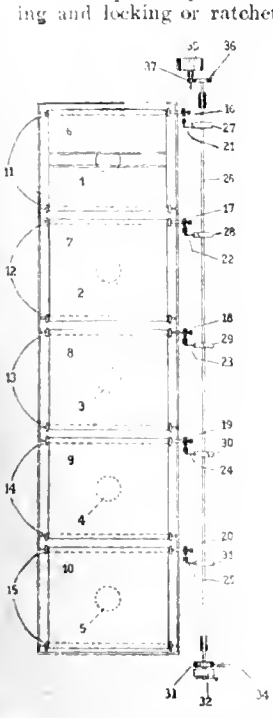
These specifications are obtainable, price 1s. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

CAMERA FOR RECORDS OF RACE FINISHES.—No. 152,287 (October 9, 1919). The invention relates to a device for photographically fixing the position of runners, race horses, vehicles on a race track with relation to each other and to the winning post at the moment of passing the same, and is intended to assist racing judges in their decision as to the winner and to the sequence of the participants in the race that pass the winning post after him.

Several cameras with independent shutters are arranged at the winning post in such a manner that the axes of their objectives are in one plane, which is perpendicular to the race track, the shutters of the several cameras being interconnected in such a manner that they can be released in pre-determined succession at the moment when the competitors arrive at the winning post.

In the drawing the lenses 1—5 situated in front are shown dotted, the shutters arranged in front of the plate are marked by the numbers 6—10. The shutters pase over pairs of rollers 11—15 respectively. Each of the rollers is provided with a winding and locking or ratchet gear device 16—20 respectively. This locking device comprises locking parts which in the drawing are shown as simple pawls 21—25 respectively. Opposite these pawls is arranged a cam shaft 26. On the same are mounted cams 27—31 in a staggered order, so that when the cam shaft 26 is rotated, the cams 27—31 come successively into engagement with the pawls 21—25 respectively. According to the degree of relative position of the same cams on the circumference of the cam shaft 26, and according to the speed of rotation of the shaft 26, the time interval between the release of the movement of the single shafts 16—20 of the roller shutters 6—10 is greater or smaller. In the drawing the cam 27 is shown in engagement with the pawl 21. The pawl 21 is therefore no longer in engagement with the ratchet wheel 16, the shutter 6 is already in motion, and is at the moment in front of the centre of the plate. When this shutter 6 has travelled its distance, the cam 28 will have reached the pawl 22, and the second shutter will become operative, and so on. Of course, with a particularly uniform setting of the cams it is possible to obtain such a quick sequence of the single photographic operations that the last shutter has already begun its movement before the first one has completely finished it. The rapidity of sequence of the single shutter openings is therefore an unlimited one. The shaft 26 is controlled by a spring mounted in the casing 32. A ratchet wheel 33 and a pawl 34 are intended for the tension, locking and release of the shaft 26. The pawl 34 can be operated either by means of pulling a stretched string, or by an electromagnet or the like. When the movement of the racing object is particularly fast, and the moment at which the winning post is passed, is therefore more particularly difficult to catch, it is advisable to make the time sequence of the single instantaneous shutters not too quick, and it then becomes necessary to brake the speed of rotation of the cam shaft 26. To that end is provided for instance a fly 35 coupled to the cam shaft 26 by means of a toothed wheel gear 36, 37. Of course, instead of a fly wheel some other braking mechanism could be provided for the cam shaft 26. By exchanging the wheels or by using flies 35 of different size, the speed of rotation of the shaft 26 can be modified at will.



The process of photographing during the passage past the winning post is as follows :—

The apparatus is placed in the plane of the winning post, so that all its lenses are in one and the same plane. The shaft 26 is set by turning, and the single shutters are also set and the ratchet gear parts 16—20 and 21—45 are brought into the ready position. The plates are then uncovered, and the apparatus is ready for photographing. Immediately in front of the winning post, at a distance which according to experience is smaller than the space covered by the racer in the time interval during which takes place the release of the first and last shutter, is provided a sight, and at a suitable distance from the apparatus the operator entrusted with the releasing takes his position, so that the line of sight is laid in a certain section of the race track in front of the winning post. The operator has to concentrate his attention on the moment in which the horses or runners or vehicles pass the line of sight. At this moment he renders the ratchet gear part 34 inoperative, the shaft 26 rotates and the shutters 6—10 begin to run. If the distance of the line of sight from the apparatus is correctly determined, the shutter 8 opens at the moment when the winner passes the post. If the operator committed a slight error, one of the shutters opening earlier or later seizes the correct moment.

By means of the known processes for quick development of the picture, the result can be shown in the picture so quickly that in case of any doubt the decision of the judge can be postponed without delaying the racing to an undesirable extent.—Optische Anstalt C.P. Goerz Aktiengesellschaft, 45/46, Rheinstrasse, Friedenau, Berlin.

RELIEF PRINTS.—No. 172,342 (June 4, 1920). Several processes have been proposed for converting photographs on silver salt colloid sheets into reliefs. For instance, by treating them with a solution of a chromate alone or mixed with a ferri-cyanide or a copper salt, reliefs are formed which are insoluble in warm water but do not coincide exactly with the silver photograph because the tanning goes beyond the silver limits and therefore close lines are liable to be merged into each other. For the same purpose the known property of pyro ammonia developers to harden gelatine containing silver was tried, but the disadvantages appeared even more marked and the whole gelatine sheet often became insoluble during development.

By the present invention the oxidation products of the polyhydroxybenzenes in the developer are used to effect a hardening of the colloid, it having been found that these products will produce a hardening which exactly coincides with the silver image and corresponds with its intensity. It is essential that but little or none of the usual preserving agent should be present in the developer, so that the generally used sulphite is to be omitted or used only in very limited proportion, that is to say, in proportion not exceeding half the weight of the polyhydroxybenzene. It is also essential that the necessary alkali should not be ammonia and that when an alkali carbonate is used, generally potassium carbonate, the quantity present must not be in so large a proportion that it prevents the photographic film from swelling, that is to say, its proportion should not exceed about 10 times the weight of the polyhydroxybenzene.

The hardening developer may be used with addition of a non-hardening developer or a reducing salt.

Instead of developing the latent silver image by a developer that has a tanning action, a non-tanning developer may be used first, and then after elimination or not of the reduced silver and after having exposed the sheet to light a tanning developer may be applied. Naturally, in this case there is an inversion of the image.

When the sheet which has been exposed through the support

or exposed from the front and then, after development, detached from the support and transferred in inverse sense to a support, has been hardened at the places constituting the image, the parts remaining soluble are removed. For instance, when gelatine is the colloid the sheet requires merely to be treated with warm water. The relief may be treated in any known manner, for instance, it may be dyed. Also the sheet may be dyed previously, or dyes or pigments may be added to the emulsion.

Suitable developers for the purpose of the invention are, in parts by weight :—

(1)	Pyrocatechin	2 parts.
	Potassium carbonate	15 ,,
	Water	100 ,,
(2)	Hydroquinone or bromo-hydroquinone (adurol)	2 ,,
	Sodium sulphite	0.5 part.
	Potassium carbonate	15 parts.
	Water	100 ,,
(3)	Pyro	2 ,,
	Sodium sulphite	1 part.
	Potassium carbonate	15 parts.
	Water	100 ,,
(4)	Pyro	2 ,,
	Methyl-aminophenol (metol)	0.2 part.
	Potassium carbonate	15 parts.
	Water ... •.	100 ,,

In order to control the action of light during the exposure it may be advantageous to use sheets containing compounds which absorb actinic rays.—Arthur George Bloxam, 30, Southampton Buildings, London, W.C.2, for Actien-Gesellschaft für Anilin fabrikation, Berlin, S.O. 36.

Trade Names and Marks.

MARKS PLACED ON THE REGISTER

The following marks have been placed on the register :—

VITTEX.—No. 408,883. Photographic printing paper and postcards L. Gevaert & Compagnie, 23, Sente Straat, Vieux-Dieux, Belgium, manufacturers of photographic materials

TRADE MARKS REMOVED FROM REGISTER

In the official language of the "Trade Marks Journal" the following trade marks have been "removed from the register through non-payment of renewal fees." Such non-payment is, of course, the method adopted by a firm having no further occasion for the use of a mark.

ROCKET.—No. 175,487. Elliott & Son. Registered in 1893 in Class 1.

DRUX (Device).—No. 175,481. Compagnie Française de Papiers Photographiques (Société Anonyme). Registered in 1893 in Class 39.

PHOTOPHANE.—No. 295,381. A. H. Cooper, trading as the Photophane Co. Registered in 1907 in Class 39.

KOH-I-NOR.—No. 295,646. Photochemische Fabrik Roland Risse Gesellschaft mit Beschränkter Haftung. Registered in 1907 in Class 39.

ANGELO.—No. 296,599. Eastman Kodak Co. Registered in 1907 in Class 39.

EURYSTIGMAT.—No. 297,772. The London Stereoscopic and Photographic Co., Ltd. Registered in 1907 in Class 8.

ALBUMET.—No. 297,799. Vereinigte Fabriken Photographische Papiere. Registered in 1907 in Class 39.

REGISTRATIONS RENEWED.

C. URBAN.—No. 297,639. The Natural Colour Kinematograph Co., Ltd. Registered in 1907 in Class 8

V. M. C.—No. 297,670. W. E. Henry, trading as The Vanguard Manufacturing Co. Registered in 1907 in Class 1.

DUCAR.—No. 297,874. The firm trading as Carl Zeiss. Registered in 1907 in Class 8.

DOLMI.—No. 298,211. Kodak, Ltd. Registered in 1907 in Class 1.

TEXO.—No. 301,114. Kodak, Ltd. Registered in 1908 in Class 39

ARTURA (Label).—No. 299,215. The Artura Photo. Paper Co. Registered in 1908 in Class 39.

TENAX.—No. 299,170. Optische Anstalt C.P. Goerz Aktiengesellschaft Registered in 1907 in Class 8.

New Materials.

PANEL PHOTETTES. A new style of the "statuette" cut-out photograph mounted on wood has been introduced under this name by Mr. A. Smith, 107, Melbourne Grove, East Dulwich, London, S.E.22. Essentially the novelty of the introduction lies in the mounting of the cut-out portrait on a panel of dark wood provided with a hinged strut. The statuette effect is thus exhibited in a striking way by contrast of the tones of the outline photograph against the dark wood background, and we can readily believe that the "Panel-Photettes" have been warmly welcomed by photographers looking for an attractive novelty for their windows and show-cases. Mr. Smith who has had a long experience in fret cutting and is a maker of cut-out statuettes for other trades, evidently is a master in the making of these goods. We notice that the wood on which the photograph is mounted is cut at a sharp angle, so that the photograph may be looked at from almost any position without showing the section of the wood. The latter, moreover, is blacked as a further precaution. Particularly for full-length portraits of children the style is exceedingly attractive. Mr. Smith issues the "Panel-Photettes" in a great many shapes at prices which are approximately 2s. 6d. in postcard size to 6s. for 12 x 10. We can advise any photographer, who requires an attractive exhibit for his window and one which will bring other orders, to make the experiment of placing a trial order for one or two of these novelties.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SUNDAY, FEBRUARY 12.

United Stereoscopic Soc. "Photography of Marine Life." F. Martin Duncan.

MONDAY, FEBRUARY 13.

Bradford Phot. Soc. "Carbro." W. H. Hammond.
City of London and Cripplegate P.S. "The Value of Failure." E. C. Perry
Dewsbury P.S. "Some Yorkshire Rambles." C. E. Lawson.
Exeter Camera Club. Annual Exhibition opens.
Glasgow and W. of Scotland A.P.A. Competition Slides and Autochromes.
Kidderminster P.S. "The Bournemouth Chines and the Cotswold Coombs." G. Embrey, F.I.C., F.C.S.
Leeds C.C. Y.P.U. Slides and "Amateur Photographer" Slides.
Southampton C.C. Lecturette Competition.
South London P.S. "Chat on Pictorial Photography." T. H. B. Scott.
Wallasey Amateur P.S. "Bromoil." T. Steel.
Walthamstow Phot. Soc. "Bromoil."

TUESDAY, FEBRUARY 14.

R.P.S. (1) "On the Relation between the Size of Grain and Sensitivity in Photographic Emulsions." Part II. Prof. Dr. The Svedberg. (2) "The Reducibility of the Individual Halide Grains in a Photographic Emulsion." Prof. Dr. The Svedberg. (3) "An Optical Method of Testing Washing Devices, together with a Demonstration of some Washing Devices." K. C. D. Hickman, B.Sc.
Belfast C.P.A. Camera Club. "Demonstration of Portraiture with Electric Light." W. L. Allison.
Birmingham Phot. Soc. Art Criticism Evening of Prints and Lantern Slides of Landscape Subjects. R. R. Carter.
Bournemouth C.C. "How a Reflex Camera is Made." Messrs. Butcher

Cambridge and Dist. Phot. Club. "Messing about with Boats." W. S. Farren and the Secretary.
Exeter Camera Club. Annual Dinner.
Glasgow and W. of Scot. A.P.A. "Old Glasgow." Ex-Bailie J. Izett.
Hackney P.S. Print and Slide Competition: Frost and Snow Scenes
Leeds P.S. "Figure Work and Landscape with Figures." T. H. Greenall.
Morley P.S. "A Trip to Manxland." H. Walsh.
Mottingham Phot. Soc. "Bromoil." Mr. Featherstone.
Nelson P.S. "Development." J. G. Williams.
South Glasgow C.C. Lantern Slide Monthly Competition.
South Shields P.S. "Bird Life" (Second Series). P. W. Webster.
Stalybridge P.S. "Genre and Figure Studies." T. Lee Syms.
Tyneside Phot. Soc. "The After-Treatment of the Negative." A. Dordan Pyke.
Welfare C.C. "Bromoil Process." John Thomson.

WEDNESDAY, FEBRUARY 15.

Birkenhead Phot. Assoc. "Photo-micrography." G. Cross
Borough Polytechnic P.S. Outings Print Competition
Catford C.C. "Pictorial Ideals." M. O. Dell.
Croydon C.C. Members' Lantern Slides.
Dennistoun A.P.A. "Colouring Bromide Prints with the Aerograph." A. Luke.
Forest Hill P.S. "Enlarging." J. A. Webberley.
Glasgow and W. of Scot. A.P.A. "Through Tyrol." A. B. Mitchell.
Halifax Scientific Society. "Pictorial Photography." J. Halliday.
Ilford P.S. "A Loon in London." W. L. F. Wastell.
Leicester Phot. Soc "Preparing the Print by Pigmenting and Stumping." J. H. Hatton.
Partick Camera Club. "Round the World with a Camera." Coatbridge P.A.
Rochdale Amat. P.S. "Lantern Slide-Making." J. C. Wild.

THURSDAY, FEBRUARY 16.

Camera Club, The. "Babylonian Magic." Dr. T. G. Pinches.
Gateshead C.C. "Process Work." R. Rowell.
Glasgow and W. of Scot. A.P.A. "Cycle and Pedestrian Camping." T. Lochhead.
Hammersmith Hampshire House P.S. "The Pyrenees." Dr. Chas. Atkin-Swan.
Letchworth Camera Club. "Bromoil." H. Kenway.
North Middlesex Phot. Soc. "Wild Flower Photography." H. Pickwell.
Tunbridge Wells Amateur Phot. Assoc. Members' Lantern Slides.
Wimbledon Camera Club. "Bromoil" Demonstration.

FRIDAY, FEBRUARY 17.

R.P.S. Pictorial Group. Address. Prof. Rothenstein.
Edinburgh Phot. Soc. Social Evening.
Glasgow and W. of Scot. A.P.A. Competition Slides and Autochromes.
Wombwell P.S. Beginners' Night. "Gas Light and Bromide."

SATURDAY, FEBRUARY 18.

Glasgow and W. of Scot. A.P.A. "Through the Grecian Archipelago." W. Butcher and Sons, Ltd.
Walthamstow P.S. Visit to a London Picture Gallery.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, February 7, the president, Dr. G. H. Rodman, in the chair.

A paper on "The Application of Flashlight Photography to the Study of Natural History Subjects" was read by Mr. Oswald J. Wilkinson, whose flashlight photographs of Nature subjects received the Society's medal at the last exhibition.

Mr. Wilkinson reviewed the applications of flashlight to Nature photography which had been made by the Keartons and Mr. Radclyffe Dugmore, and showed a photograph of a lion in his native habitat taken by Mr. Cherry Kearton in Africa. He passed on to describe his own experiments in obtaining photographic records of moths, larvæ, spiders and similar small subjects at night by flashlight. He was accustomed to work with the camera set at an extension of about double the focal length of the lens, so as to give approximately same size reproductions. The camera was thus about 12 inches from the subjects. The flash powder was likewise placed at about this same distance. With a lens aperture ranging from *f*/22 to *f*/32 (it was not clear whether nominal or effective), and with a Wellington Anti-screen plate exposed through a K 1 filter, the quantity of flash powder (Johnson's Professional) ranged from 30 to 60 grains. Mr. Wilkinson showed numerous lantern slides, the full gradation and detail of which afforded ample evidence of the full exposure obtained under these conditions. He referred to the great necessity of keeping the flash powder dry. He had chiefly used a touch-paper method of firing, but was convinced that an electric firing method was essential in order to make the flashlight method of general usefulness in Nature photography, since, in many circumstances, it was necessary to fire the flash immediately a subject had come into position.

Mr. Wilkinson also showed a series of Paget colour transparencies of butterflies, photographed same size by flashlight, again by burning the flash powder a few inches away from the subject. A short discussion followed, in which Messrs. E. J. Bedford and Hugh Main referred to the value of flashlight methods in photographic Nature study, and paid a tribute to the correctness of colour rendering of Mr. Wilkinson's Paget transparencies.

Mr. A. C. Banfield suggested that a matt parabolic reflector might be used as a combustion chamber for the flash powder, and would greatly reduce the quantity of powder required. As a protection of the flash powder against damp in outdoor work, a very simple plan was to make a few bags of tissue paper dipped in solution of celluloid dissolved in amyl acetate. The flash powder would keep dry in such capsules, and, moreover, was instantly fired by any of the usual methods of ignition.

On the proposition of the chairman, a most hearty vote of thanks was accorded to Mr. Wilkinson for his lecture.

CROYDON CAMERA CLUB.

Certainly one of the most "wonderful evenings," in the words of a member, was afforded last week, by Mr. C. P. Crowther, F.R.P.S., with his sensational divertissement, entitled "Portraiture with a Portable Light," helped by the lively environment.

A strong counter-attraction was also provided in the comely shape of an exceedingly fair young lady—Miss Dorinea Shirley, specially released for the occasion from that stage where the star ultimately twinkles many times a second on the screen. Lady visitors are so unusual that the kindly "office boy" vacated his usual seat for one contiguous, ostensibly for the purpose of protecting the fair one from the blandishments of the president. This tale, however, fell flat.

To report Mr. Crowther adequately would be an extremely difficult task, it being almost impossible for printers' ink to reconstruct the ethereal atmosphere created. Actualities are always subordinated to sentiment, and a rushing enthusiasm, and poetic flow of ideas, hypnotizes cold judgment for the time being. But it cannot be gainsaid never was a lecture listened to more attentively at Croydon, though primarily intended for professional photographers, and the stirring appeal made for all to take a pride in their art and strive for better things can never fail to influence but in the right direction. Scathing, but absolutely true was a brief allusion to the smug self-complacency exhibited by not a few artists of the camera concerning their own work, standing out in painful contrast to the attitude adopted by their brethren wielding the brush. Additional weight also attached to Mr. Crowther's remarks, as he can not only give good advice but deliver the goods, even if they may be rather strong meat for a conservative general public apt to resent innovation.

When dealing with faces delineated as a map, or (preferably) otherwise, he approached Mr. Inskeep, and after regarding him steadfastly convulsively hid his own face with his hands. "Well, you need not be so aghast, for it is not a bad dial as dials go," tartly commented the office boy. From that moment war was declared, and throughout the evening, at intervals, the unfortunate official was badly mauled, it being almost impossible for him to get in a word edgeways in self-defence.

Turning to the main theme of the evening, that of "intimate photography," all depended upon getting *en rapport* with the sitter. Even on occasion he had employed such terms as "my dearest" or "my darling" to achieve the desired end, a procedure, it may be remarked, however safe it may be for married men with the artistic temperament, is fraught with grave peril to the bachelor operator.

Associated with this "intimate photography!" was a near viewpoint necessitating a comparatively short focus lens. Mr. Pirie Macdonald (who was often quoted), he said, largely uses a lens of

12½ ins. focus on 10 by 8 plates, the prints being trimmed to 9 by 6. He had also told the lecturer that it had taken him 2½ years to master the focus of this lens. No details of the prolonged combat were given, but the incident shows the danger of allowing a fierce focus of this size to get out of hand. Many present must have resolved to use nothing but vest-pocket cameras in the future.

Frequently Mr. Crowther had employed a 15-in. lens on a 12 by 10 plate, avoiding distortion by "over-focussing" (apparently on a point in advance of the sitter). Ordinarily, however, he focussed on a point midway between the eyes and the nose. Much emphasis was laid on the importance of subordinating the ears which over-focussing achieved. Equal stress was laid on the necessity of a good rendering of the hands.

A set of superb portrait studies, by Mr. Crowther, were next shown on the screen, all taken with a practically point source of illumination diffused as required, the shadow side being lightened by reflectors when necessary. The orthodox angle of illumination, 45 deg., was strongly recommended. A set of really splendid Paget colour slides followed, particularly good being some low-toned reproductions of pictures.

A portable apparatus for home portraiture when electric light is available, recently put on the market by Messrs. Marion's, was then erected, and members set gaily to work with the young lady visitor as the willing victim. A large hat, whose capacious brim afforded support to straggling things simulating a shimmering waterfall necessitated the illuminant being brought low. So will the sitter, probably, if ever she sees the results, for the lecturer admitted it was very difficult indeed to get under that hat. As a matter of fact no member had the audacity to attempt it.

Mr. Crowther said he was no electrician, but correctly advised the use of large candle-power gas-filled lamps, owing to the higher temperature of the filament, and greater actinism of the light compared with lamps of more moderate candle-power. Unfortunately the former tended to blow the fuses on ordinary household circuits.

In this connection, and writing subject to correction, branch circuits are designed to carry three ampères and upwards. True, a 2,000 c.p. 200 volt, and a 1,000 c.p. 100 volt lamp, take five ampères, yet overloading the circuit for a short time to this extent will do no harm if a stouter fuse be temporarily employed, and care be taken that no other lamps on the circuit are running. Anyway, the production of a lamp of maximum illumination, which can be safely used alone on household circuits, if not already on the market, ought to be. It would far surpass in efficiency the four moderate candle-power lamps employed by Mr. Crowther. In all other respects the apparatus appeared admirably adapted for home portraiture, and, excluding the lamps, folded into a surprisingly small compass.

The discussion was a discussion with a vengeance, and can only be touched upon. Mr. Salt agreed that it was desirable for photographers to unrut themselves, but if all adopted the "artistic style," for want of a better term, another rut would be fashioned. They could then revert to present-day practice. Very short focus lenses undoubtedly had their uses when camera and operator necessarily were brought close to a fascinating sitter, but otherwise he preferred a long focus lens for reasons well-known.

Mr. Catharine modestly pointed out that as he and Mr. Pirie Macdonald largely went in for "head and shoulders," they were both much on the same level. Mr. Catharine then passed on to a critical examination of the distance *expressed in feet*, which in the print apparently separated nose and ears in the "intimate photography" system, during which Mr Crowther afire began slowly to approach the speaker, who not liking the look of things backed into some cameras, and was forced to sit down.

Mr. Handel Lucas severely chided the lecturer for leading the tyro straight into impressionism. Noble sentiments on an elevated plane then flowed freely from Mr. Jobling, who throughout preserved a happy smile, which ill-harmonised with the solemnity of the subject. The president, Mr. John Keane, in proposing a vote of thanks, which was carried with much acclamation, very truly said that the enthusiasm of the lecturer had undoubtedly proved infectious. General verdict—an altogether O.K. evening.

Glasgow and West of Scotland Society of Professional Photographers.—The monthly meeting of the above Society was held on January 27, in Mr. Bairnfier's Studio, Sauchiehall Street, Glasgow, when there was a good turnout of the members. The subject for the evening was "Print Criticism." Prior to the date of the meeting members were asked to submit prints for criticism, and the keen interest of the members in the work of the society was shown by the large number who sent in samples of their work. The critic appointed by the Society was Mr. E. Drummond Young, of the Edinburgh College of Art, whose criticism was most interesting and instructive, and very much appreciated by all the members present.

Herefordshire Photographic Society.—At the annual meeting of the Herefordshire Photographic Society, held at 76, Eign Street Hereford, on Monday evening (January 30), a number of new officials were elected, and there seemed to be a general desire for a reconstructed programme. A keener spirit was shown than for several years past, and the Society's future, therefore, is looked upon with interest. Mr. Alfred Watkins, F.R.P.S., who has been president for a number of years, expressed a desire to vacate office, on account of health reasons, in favour of someone else, and his resignation was received with much regret and sincere thanks for his past services. It was decided to ask Mr. J. S. Arkwright, who has taken a great interest in the Society, to become president, and the following were elected vice-presidents: Mr. Alfred Watkins, Mr. John Parker, Mr. W. J. Humfreys, Mr. W. C. Gethen, Mr. Ernest Davies, Mr. S. Beeson, Dr. Day, Mrs. G. Leigh Spencer, Mr. A. G. Turner, Mr. S. Roberts, M.P., and Mr. C. T. Pulley. On the management committee were appointed Mr. W. Williams, Mr. W. W. Robinson, Mr. W. A. Grosvenor, Mr. H. E. Pile, Miss McAdam, Mr. Best, Mr. Ernest G. Davies, Mr. McKaig, Mr. Carter, Mr. Copeland, Mr. A. Livesey, Mr. Walter Pritchard, Mr. S. Beeson, and Mr. Brooke. Mr. A. Livesey was thanked for his kind services as hon. secretary and treasurer for the past seven years, and his office was undertaken by Mr. Godfrey Davies, 7, Eign Street. Mr. W. J. Davies was reappointed librarian, Mr. S. Beeson lanternist, and Mr. A. C. Slatter auditor. It was resolved to hold meetings on the second Friday in each month.

Commercial & Legal Intelligence.

NEW COMPANIES.

Stead and Co., Ltd.—This private company was registered on January 26, with a capital of £1,500 in £1 shares. Objects: To take over the business of a drug store keeper, photographer and photographic dealer carried on by Annie M. Huband, at 23, Duke Street, Brighton, as "Stead and Co." The first directors are: C. J. Huband, 11, Clarence Square, Brighton (permanent managing director and chairman); Mrs. A. M. Huband, 11, Clarence Square, Brighton; F. W. Fowles, 8, Richmond Place, Brighton. Registered office: 23, Duke Street, Brighton.

Latters, Ltd.—This private company was registered on January 30, with a capital of £1,000 in £1 shares. Objects: To carry on the business of retailers, merchants and compounders of, dealers in and agents for the sale of all kinds of chemicals, and manufacturers of and dealers in chemicals, toilet requisites, photographic cameras, lenses, plates, films, etc. The first directors are: C. C. Lever, Little Bekkons, Beaconsfield, Bucks; W. H. Lessiter, 80, Hunsdon Road, New Cross, S.E.14. Qualification: £50. Remuneration as fixed by the company. Secretary: C. C. Laver. Registered office: 46a, St. George's Road, S.E.1.

Coloured Blue Prints.—According to a German patent, No. 341,735, of February 15, 1921, abstracted in the "Journal of the Society of Chemical Industry," the Dürener Fabrik. Phot. Papiere Renker und Co. add a red or orange dyestuff, such as azo yellow or benzo fast red G, to the sensitising solution of ferric ammonium citrate and potassium ferricyanide, or to the paper before sensitising. The resulting prints have coloured lines on a blue ground. The green tone which an ordinary blue-print assumes on long keeping is changed by the complementary action of the dye to white. By selection of the dyestuff so as to obtain the same transparency to actinic rays for the lines and the background fraudulent copying of such prints is prevented.

News and Notes.

PHOTOGRAPHY ON RAMSGATE SANDS.—In the published list of fees payable for sand "pitches" at Ramsgate during the present year appears the following: "Photographing bathers, £100 each." Hiring out donkeys is only £35.

BRUSSELS COMMERCIAL FAIR.—The third commercial fair, organised by the Brussels Municipality, is to be held from April 3 to 19. Photography and cinematography form Section 33. Particulars of charges for exhibition space, etc., are obtainable from 19, Grand Place, Brussels.

ROYAL INSTITUTION.—On Thursday next (February 16), at three o'clock, Professor Arthur Perkin begins a course of two lectures at the Royal Institution on "Dyeing: Ancient and Modern," and on Saturday (February 18), Professor Ernest Gardner delivers the first of two lectures on "Masterpieces of Greek Sculpture."

KORISTKA OPTICAL APPARATUS.—The City Sale and Exchange inform us that they have been appointed sole British agents for the Koristka Optical Co., of Milan, makers of microscopes, photographic objectives and other optical apparatus. Abridged catalogues are obtainable on application to 81, Aldersgate Street, London, E.C.1.

TELEPHOR LONG-DISTANCE PHOTOGRAPHY.—A message from Budapest gives details of the invention of a young Hungarian engineer, which has aroused much interest in Paris. The inventor (says Reuter) has constructed an apparatus named the "Telephor," which it is claimed enables photographers to see and to photograph objects far away.

DENNISTOUN AMATEUR PHOTOGRAPHIC ASSOCIATION.—The Society's exhibition will be held from March 27 to April 8. There are two open classes, one for prints and the other for lantern slides. Mr. James McKissack will judge, and the latest date for the receipt of entry form and exhibits is March 14. Particulars and entry form from Mr. Colin Graham, 448, Duke Street, Dennistoun, Glasgow.

THE PENROSE PROCESS POCKET BOOK.—The pocket diary issued by Messrs. Penrose is of convenient narrow and slim form for the waistcoat pocket, and contains numerous optical and chemical formulæ and tables of special interest to photo-engravers, as well as a comprehensive series of tables for the ready reckoning of areas and prices of blocks. Messrs. Penrose issue it at the price of 2s. 6d.

CRIPPLEGATE AND HACKNEY EXHIBITIONS.—Arrangements have been made by which exhibits entered for the exhibition of the City of London and Cripplegate Society's exhibition will be transferred to the Hackney Society, whose exhibition opens a fortnight after the closing of that at the Cripplegate Institute. Exhibitors who wish to take advantage of this arrangement are asked to notify their desire on both entry forms.

CAMERA SMUGGLING AGAIN.—A Mr. Jean Sauvnani had to pay £54 15s. 6d. at the Dover Police Court last week for smuggling articles, including binoculars, opera glasses and a camera. The goods were not declared, and were discovered wrapped up in different pieces of underclothing. The camera he had brought from Germany for his wife. The Customs officer asked that Mr. Sauvnani should pay the full penalty, as he was a constant traveller to the Continent. Double value was exacted and the goods confiscated.

FLASHLIGHT PHOTOGRAPHY.—Messrs. Johnson & Sons, 23, Cross Street, Finsbury, London, E.C.2, have just issued an eight-page booklet of instruction in flashlight work, illustrated with a number of reproductions of photographs showing the many attractive subjects, for at-home photography during the winter months. Occasional professional users of flashlight will appreciate the exposure tables giving the quantity of powder which should be used according to the distance of the flash from the subject, speed of plate and aperture of lens. The booklet is obtainable free on application.

ROYAL PHOTOGRAPHIC SOCIETY.—At the meeting arranged by the Scientific and Technical Group for Tuesday next, February 14, two papers by Professor The Svedberg will be read, one on the relation between sensitiveness and size of grain in photographic emulsions and the other on the reducibility of the individual halide grains in a photographic emulsion. A paper by Dr. S. E. Sheppard and A. P. H. Trivelli dealing with Professor Svedberg's method of grain analysis will also be read; and Mr. K. C. D. Hickman will describe an optical method of testing washing appliances and will give a demonstration of some washing devices.

"A MAGISTRATE-PHOTOGRAPHER."—With reference to a note under this heading on page 69 of our last week's issue. Before any evidence was called at the resumed hearing of the case last Friday the chairman of the magistrates referred to the matter saying: "A statement has been made by several newspapers that at the last hearing a magistrate sitting on the bench took a photograph of Major Armstrong in the dock. The magistrate in question was not a member of the bench, but by courtesy occupied a seat at the back of the sitting magistrates. While the magistrates had retired to consider a point of law, the magistrate in question took advantage to use his camera. This bench is very much annoyed at the fact, and they would not have permitted it for a moment if they had known such a thing was going to happen. I think it is a great liberty, and a great want of taste on the part of the gentleman in question to have done such a thing." The matter then dropped.

PHOTOGRAPHIC MATERIALS FOR EGYPT.—The Department of Overseas Trade is informed by His Majesty's Commercial Agent for Egypt that the Ministry of the Interior, Egypt (Personnel and Equipment Department, Supplies Office) has invited tenders for the supply of photographic material for the year 1922, which will be received by the Director, Personnel and Equipment Department, Ministry of the Interior, Cairo, not later than noon on March 15. The photographic material required includes apparatus and accessories, chemicals and plates and papers. A copy of the conditions of tender is available at the offices of the Department of Overseas Trade (Room 53), 35, Old Queen Street, London, S.W.1, for inspection by interested United Kingdom firms, while an additional copy is available for transmission to provincial firms unable to arrange for inspection in London. Local representation is an essential condition of tendering, and the Department will be pleased to suggest to United Kingdom firms not already represented in Egypt the names of British houses established in Egypt through whom tenders might be submitted.

Correspondence.

*** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** We do not undertoke responsibility for the opinions expressed by our correspondents.*

DECADENT PRESS PHOTOGRAPHY.

To the Editors.

Gentlemen,—Permit a humble reader like myself to congratulate you upon your plain-spoken note on the decadence of press photography and the lamentable position of the art to-day—as represented by the picture papers.

You are by no means alone in your opinions, for a contemporary ("The Bazaar, Exchange and Mart") said some very outspoken things a few days before your comments appeared. Said the "Bazaar": "Taking up any illustrated paper . . . you can at once see what subjects the editor considers to be of the greatest interest, and you are pretty sure to find that precedence is given as follows: (1) Smudgy portraits of well-known or unknown persons, preferably brides and bridegrooms. (2) Girls and children doing whatever happens to be seasonable at the moment. They are shown bathing from June to September; on ice or snow from December to February. (3) Football, cricket, golf and other sporting snapshots. (4) Stage subjects and actresses "at home." (5) Comic pictures, and (6) Photographs of real interest, showing important events of the day. There is a marked falling off."

It may be argued that an analysis of the above proves a state of affairs in favour of the amateur and professional worker rather than the legitimate press photographer, and that no harm is done to our profession as a whole, seeing that photographs of one kind or another are used.

Even the most kindly critic, however, will, I think, admit that the art of press photography proper does not hold the important position it once did, which is a pity, seeing that so many operators have worked hard to make themselves proficient in the art of taking subjects the studio worker or the more skilled amateur would not bother about, subjects which were in great demand some years ago, but which to-day are made to give way to subjects of the "still life" and "Kiss Mammy" type.—Yours faithfully.

FOCAL-PLANE.

HELP FOR THE PRESS PHOTOGRAPHER.

To the Editors.

Gentlemen,—It would be a good thing for Press photographers if owners and layers-out of race tracks, playing pitches, etc., and the builders of pavilions, grand stands, etc., gave photography a little thought. It is, I know, a lot to ask of them, but seeing that the camera now plays an important part in the picturing of sporting events, and the publicity we give to them, something, I think, might be done to make our work easier.

I am moved to pen this note by the announcement that a race track with the usual "fittings" is to be constructed at Bournemouth, and that it is hoped to make this town the Ascot of the South Coast. Happily the track is planned in a new manner, and one particularly favourable for photography—if the grand stand is properly placed. The shape of the track is, roughly, a figure of eight—something like that at Auteuil and other Continental courses—which enables one to have a sight of the horses from start to finish of every race. The advantage of this will be appreciated by all who have waited, almost at fever heat and with finger on the shutter release, for the horses to come round the corner—often too suddenly to make a good picture of them.

Then there is the question of the position of the pavilion or grand stand—or, in other words, the lighting on horses or players. All French stands, I believe, have the sun behind them, but the Ascot grand stand faces about due south, and the stands at the July Course at Newmarket have the sun staring them in the face. The pavilion at Lord's has its back to the setting sun, but that at the Oval is not so well placed, and I have yet to see really good cricketing pictures taken from the latter.

There may be some rule for placing a pavilion or grand stand in a certain position, but I do not think such a rule can exist, because of the many different positions I know of; a few are suitable for photographic work, but the majority of them not so.—Yours faithfully,

SPORTS' PHOTOGRAPHER.

TRIMMING AND MOUNTING STEREOGRAMS.

To the Editors.

Gentlemen,—Your correspondent, "C. E. B." (January 27, p. 58), aroused a dormant interest in the writer, a former keen amateur stereoscopic worker.

Regarding the astonishing ignorance as to transposition, I may say that in a set of 200 original stereos I included two purposely untransposed specimens. The experience I had was that every friend pulled up at those two, but their descriptions of the errors always varied in detail, though not in the opinion that *something* was wrong.

Regarding the trimming, the majority of my pictures were trimmed and measured, as "C. E. B." suggests, and dry-mounted with coincident points 2½ in. apart, as mounted. The left picture had more of the view on the right edge, and *vice versa*.

But I took a number of views of small bronze equestrian models, deliberately placing the horse with its outspread forelegs pointing at my lenses. These I mounted with more margin on the left side of the left picture and right side of the right picture—a plain background being employed. Coincident points were 2½ in. apart.

The effect to *all* observers was a startling realism of the animal galloping in front of the mount instead of receding from it, as should most landscape views.

I proved also that by trimming prints exactly coincident the effect on friends varied seemingly according to eyesight. Those with excellent sight could not say whether the picture was behind the mount or in front of it—presumably upholding the theory of trimming, probably unconsciously. Those with manifest defective sight contradicted themselves again and again—a curious phenomenon.

I had a standard stereo camera, and confess I found little use for the rack and pinion separation device of the lenses. These were adjusted at 2½ inches, nor did variation of this distance appear to make any difference in the results.—Yours faithfully,

PHILIP H. WILLIAMS, F.C.A.

The Camera Club, 17, John Street, Adelphi, W.C.2.
February 2

ASSISTANTS' QUALIFICATIONS.

To the Editors.

Gentlemen,—I agree with "Belgravia." Good finishers *are* almost impossible to get. I have had his experience of interviewing dozens of duds, and why? It is largely a question of wages. Finishing, if it is finishing and not simply glorified spotting, takes a woman (or man) of experience, talent and refinemet.

We cannot expect photographers to impart all the necessary knowledge, free, to a paid apprentice, but the assistants should see to it for themselves, go to classes and show a little enthusiasm towards gaining the necessary skill. When gained, however, it should command its price. Fashion artists, illustrators, and other artistic workers are very much better paid than finishers, and this is where the talented girls get to very largely. In one case I know of a firm that nearly had apoplexy at having to pay a really tip-top finisher 50s. a week, when they were paying gladly £3 3s. to a man who helped the outdoor operators and *cleaned the motor car*. That same girl, the finisher, is now getting £5 per week as an operator, and a good finisher is lost to the world. Moreover, that firm is still looking for a really good artist finisher, salary about £2 2s. My good Mr. Photographer you will not find her, for she could not live on it. Standardise wages if you will, and make it worth while for the artist.—Yours truly,

A WOMAN.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

A H.—Actual makers of adhesive seals are Messrs. William Sessions, Ltd., The Ebor Press, Earswick Station, York.

W. H. G.—There are not many books on aerial photography. The best general work is "Airplane Photography," by F. E. Ives, published by the J. P. Lippincott Co., and obtainable through any bookseller, price 18s.

A. H. S.—Not practicable to body-dye except in manufacture. You can, of course, stain a gelatine coating, but, for the sake of uniformity of the colour film, it would be better to coat with a dyed gelatine solution. Suitable dyes from Ilford, Ltd., Ilford, London, E.

A. E. H.—(1) Filter Yellow K, or similar dye, from Ilford, Ltd., Ilford, London, E., or British Drug Houses, Ltd. 16-30, Graham Street, City Road, London, N.1. (2) The following metol formula is very suitable. Metol, 150 grs.; sodium sulphite, cryst, 2½ ozs.; sodium carbonate, cryst, 3½ ozs.; potass bromide, 16 grs.; water, 20 ozs.

S. E.—(1) There is no reason why the solution should not keep well. We have kept solution of very similar colour for many months. The solution is just about the same colour as the pre-war commercial solution which kept very well. (2 and 3) We think there is nothing to complain of in the colour. In our experience it is not possible to get a perfectly water white solution. You do not say whether you have tried the developer practically. If it is unsatisfactory in practical use and you will

let us know what is the matter with it we will see if we can help you further.

W. THOMPSON.—(1) Cassell's "Cyclopædia of Photography,' edited by Bernard E. Jones, published at 10s. 6d. It is now out of print, but no doubt you could obtain a copy from Messrs. Foyles, 121-123, Charing Cross Road, London, W.C.2. (2) We could have formed some idea if you had sent a negative. A lens of this focal length ought to cover a postcard plate satisfactorily. With nothing to go upon, we are unable to suggest a cause. (3) Particulars of the focal lengths are not given in the catalogue, but it is quite easy to find the focal length of your lens by focussing upon a distant object, say a church spire half a mile or so away, and then measuring the distance from the lens diaphragm to the focussing screen. At the same time we should think there is very little to gain, in view of the narrow angle of view which is covered, in replacing the R.R. by an anastigmat.

L. H.—The reason for using an anastigmat in preference to a rectilinear or euryscope is that the former has much better covering power at a large aperture, that is to say that the anastigmat would perform as well at *f*/8 as the euryscope at *f*/16, or perhaps even *f*/22. If length of exposure does not matter, the older type of lens will be quite satisfactory. The Thornton-Pickard behind-lens shutter is fitted with loose fronts, so that you can use different sized flanges, or you can have brass adapting rings to fit your smaller lenses and the largest flange you intend to use. You can have these made by Messrs. Taylor, Taylor & Hobson, of Leicester, who stock all standard flanges, or you can get them made to order by Messrs. Fairbrother & Bowen, 9, Farringdon Avenue, London, E.C.4. You must take the risk of the water company charging you for water used for trade purposes. Surely you do not wish to avoid a just claim. At any rate, the extra cost will not be much, especially if you state your intention, and do not leave the water company to find out for themselves.

J. D.—(1) You can obtain actual photographs and coloured postcards from such firms as W. A. Mansell & Co., 405, Oxford Street, London, W.1, but as a collection of these would be rather costly, we should recommend you to obtain some of Gowan's Art Books. These contain in each volume sixty small reproductions of pictures. Each volume is devoted to one artist, and the cost is, we believe, 3d. A more elaborate series on the same lines is "Masterpieces in Colour," a volume containing eight reproductions in colour by one artist, published at about 2s. 6d. If you write to Messrs. Gowan & Grey, London and Glasgow, and Messrs. T. C. & E. C. Jack, London, for lists, you can make your own selection and order through your local bookseller. You can get all particulars of the "statuettes" from Messrs. Campbell Gray, Ltd., 88, Edgware Road, London, W.2, who will mount your own prints in this style at a very reasonable price. (2) Portraits to imitate marble are made by well powdering the sitter's hair and face (a white wig is better than powdered hair) and draping the shoulders with a white fabric. (3) The book, "Trick Photography," is out of print, but you could probably obtain a second-hand copy from Messrs. Foyle, 121-123, Charing Cross Road, London, W.C.2.

H. C. S.—Steel is not an easy metal to etch by the photo-mechanical method, on account of the difficulty of keeping the resist intact during etching; this, however, can to an extent be remedied by depositing upon the surface to be etched a thin coating of copper. The best dry plate to use for making the negative and positive to print from is either a Wratten Special Process plate or an Ilford Process plate, using the developer recommended by the plate makers, and developing for two minutes at a temperature of 63 deg. F. The plate, after development, must be well washed and then fixed in a fresh hypo bath (20 per cent.) for 10 minutes. A slight reduction to clear away any signs of scum is advisable, using either the cupric ammonium chloride or iodine cyanide reducer, and then to obtain the greatest possible density, intensify with mercuric bromide, and blacken with silver cyanide; this remark especially applies to the positive. Having obtained the photographic stencil, it can be printed on the steel by the bichromate albumen method, and, after development, the ink image be dusted with fine bitumen powder, which must be incorporated in the ink by heating. Should the steel be used without a copper coating, it must, before coating, be well cleaned with the finest pumice powder, then washed and placed in a 10 per cent. ammonia solution; when removed it should be coated at once. The steel is etched in a 35 Beaumé vol. of perchloride of iron, heated to a temperature of 75 deg. F. If great depth is required, it is treated as when etching an ordinary zinc block. The ordinary half-tone enamel can be used for the resist, or bichromated gelatine. This latter resist is obtained by printing upon a special carbon paper made by the Autotype Co., then transferring to the steel, which has been previously ground, as is usual in the photogravure process. The etching is done in a 33 Beaumé bath of perchloride of iron. This method will not give the depth like the first method, but is suitable when gradation is required. Aluminium and brass nameplates can be easily made by the photo-engraving method. Take a piece of highly polished metal and coat with bichromated albumen, print from the negative, and, when printed, roll up with the usual ink, dry, but do not powder with bitumen. Slightly etch in perchloride of iron, and then wash and well dry. Spray or carefully paint over the surface black celluloid varnish; when dry, remove ink image with petrol or turps, which will come away after gentle rubbing with cotton wool. After clearing the ink resist away, the image will show up as polished metal on a black ground. There are many ways of modifying this method to obtain different effects. If you are an engraver, and not acquainted with the working of photo-etching methods, it would be as well to obtain some instruction in the making of blocks. This instruction can be obtained at the L.C.C. School of Photo-Engraving and Lithography, Bolt Court, where the making of nameplates is taught, also facilities afforded to experiment with etching on steel.

M. R. B.—We quite sympathise with you in the trouble you are having. So far as your manipulation is concerned, the only two suggestions which can be usefully made are:—(1) Wash for a very short time (just a rinse) between developing and fixing. It is possible that the production of the stain is concerned in some way with oxidation of the developer before fixing, and, if that is so, you only aggravate the cause by washing for any length of time between these two stages. It's not the most likely of causes, but, at any rate, there may be some result from making the modification. (2) We don't believe in the use of any hypo-killer. We don't know what the hypo-killer is made of—probably persulphate or some similar oxidising agent. But, at any rate, if you wash for half an hour in a constant stream of water which you get in a turbine washer, provided prints are separate and on the move all the time, there is certainly no advantage whatever in using a hypo-killer. We note that you have tried dispensing with the killer, without any benefit. But try leaving out any hypo-eliminator, and also curtailing washing between developing and fixing. Simply give each print a rinse in a vessel provided with a good flow of clean water, and transfer at once to an acid fixing bath, being particular that the print is thoroughly immersed below the surface, say by a "paddle" of wood or ebonite. There is nothing in any other of the particulars which you name to account for the stain, and if the suggestions we have made above are of no benefit, we think you have no alternative but to take the matter up with the makers, getting them to make some prints on marked pieces of the paper.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3224. Vol. LXIX. FRIDAY, FEBRUARY 17, 1922. Price Fourpence.

Contents.

SUMMARY.

The fourteenth Scottish National Salon opened at Hamilton on Saturday last, and remains open until to-morrow week, February 25. Some notes on the exhibition, by Mr. Archibald Cochrane, one of the judges, will be found on page 91.

In a paper compiled for the purposes of a lecture at the Croydon Camera Club, Messrs. Vivian Jobling and E. A. Salt have brought together in a very comprehensible form a consideration of the chief factors determining the speed of a lens. (P. 93.) In the concluding portion of their paper, working drawings and description are to be given of an apparatus for the direct measurement of the F No. of a lens.

M. L. P. Clerc, in his "Paris Notes," announces that it is the intention to celebrate 1924 as the centenary year of photography by holding an international congress and exhibition in Paris. (P. 92.)

At the Royal Photographic Society, on Tuesday evening last, papers by Dr. Svedberg on emulsion grain aroused much discussion. Mr. K. C. D. Hickman, in the course of a paper describing investigation of the washing of plates, demonstrated a very ingenious attachment for use with an ordinary dish, and also a novel eccentric rocker designed on a pneumatic principle. (P. 99.)

The comprehensive paper by the Rev. H. C. Browne on the optical conditions to be observed in the taking, printing, and viewing of stereoscopic photographs is concluded in the present issue. (P. 96.)

The Edinburgh Society of Professional Photographers have recommended a schedule of minimum prices for commercial photographic work. The schedule will be found on page 100.

A feature of the Photographic Fair at the Horticultural Hall, Westminster, May 1 to 6 next, is to be an exhibition of American professional portraiture. (P. 89.)

Photographers in the United States are invited to contribute to this exhibition. A thirty-guinea silver cup will be awarded for the best group of portraits. The judge will be Mr. William Crooke. (P. 101.)

We again draw the attention of assistants answering Box No. advertisements to the imprudence of sending specimens or originals of testimonials to unknown advertisers. (P. 90.)

The print or enlargement giving a bas-relief effect which can be made from a combination of a negative and positive transparency forms an attractive window display. (P. 90.)

In a paragraph on page 90 two prescriptions are given for the reduction of toned over dark P.O.P. prints.

Sufficient pressure of the back in the printing frame or box is a precaution in dealing with double-weight papers. (P. 99.)

EX CATHEDRA.

American Professional Portraiture.

An announcement of great interest to professional photographers is made by Mr. Arthur C. Brookes, organiser of the Photographic Fair, which will be held at the Royal Horticultural Hall, Westminster, from May 1 to 6 next. Mr. Brookes is arranging an exhibition at the Fair of portraiture by professional photographers in the United States. The collection, which is expected to number several hundred, will be arranged in the lecture hall, which on previous occasions has been used for the meetings of the P.P.A. Congress. American professionals have deservedly a reputation for originality and variety of style, and there can be little doubt that an exhibition of more than ordinary interest will be brought together. Mr. Pirie Macdonald, when addressing the professional photographers gathering in London last summer, dwelt particularly upon the versatility of his compatriots, and instanced quite a number of men in different parts of the United States whose work ranked as regards freshness and outlook with any which he had seen in Europe. The exhibition will be open to all visitors to the Fair, and, if recent public and private correspondence which has reached us is any criterion, the Fair itself will be attended as largely as hitherto by professional portrait photographers in London and the Provinces. Portraitists should, therefore, make a note of this opportunity of seeing a representative collection of American work, for it should prove to be a much larger and more important one than has previously been brought together.

* * *

Printing Double Weight Papers.

The continuously greater use which is being made of double-weight papers of practically postcard substance for portrait photographs, inserted without mounting in the popular folders, calls for somewhat greater care in printing. The curl of a fair-sized piece of such paper may easily be such that proper contact over all parts of the negative is not obtained in a printing frame fitted with the customary rather weak springs, or in a printing box if hand application of the pressure back chances to be done in a careless manner. With some printing boxes uniform pressure of the back calls for correct manipulation of the handle, and when a thick paper is being used, it is quite possible to have faulty contact over part of the negative. In many cases this liability may be readily remedied by thickening the pressure pad by fixing a stout piece of felt to it, or by laying a piece of felt upon the paper after inserting a fresh piece of the latter. A precaution such as this will, of course, be taken by the experienced printer, especially if he has been accustomed to handle carbon tissue, the pronounced curl of which calls for the frames of extra solid construction provided with strong springs fitted to hinged cross bars. The fact that exposure of papers is often placed in the hands of

comparatively unskilled assistants is no doubt responsible for defects of definition in prints which have been submitted to us with the suggestion that the lens was at fault. That such was not the case should have been evident from the fact that the unsharpness occurred in different parts of the subject from the same negative.

* * *

Assistants' Specimens. Our publishers ask us to remind assistants that it is unwise to send specimens of their work to advertisers whose announcements appear under a box number. It is evident from many of the packages which are addressed to our publishers for transmission to box-number advertisers that this caution is being disregarded by many. In their own interests we hope that assistants will bear it in mind. It is quite unnecessary that they should send specimens in the first instance, because we expressly prohibit the request for specimens in an advertisement which is issued under a box number. There was in the past much abuse of assistants in this way, and our prohibition has been made for the purpose of protecting assistants from unscrupulous people who endeavoured to make our advertisement pages the medium for obtaining specimen photographs. Assistants, we are sure, will understand that they are only nullifying this protection by sending specimens of their work to people of whose identity they are ignorant. Although not in quite the same category, this caution applies also to originals of testimonials.

* * *

Reducing P.O.P. Prints. While an over-developed bromide or gaslight print may be reduced in depth with so little alteration of its colour as to allow it to pass muster among others which have been correctly developed, there is unfortunately no reducer which will render a similar service to a P.O.P. print which is darker than others of a batch. Nevertheless, occasions arise when it is convenient to be able to correct the error of over-printing in the case of a single print, for example, when a P.O.P. is required at very short notice and time cannot be spared to take off another from the negative. In these circumstances there are two reducers which in our experience answer admirably for the purpose. One is the ordinary persulphate reducer, which certainly alters the colour of the print, but in a manner rather favourable than otherwise, changing the purplish image to one more in the direction of a cold black. The other reducer is that made by dissolving about 10 grs. of potassium ferricyanide and 20 grs. ammonium sulphocyanide in 4 or 5 ozs. of water. Both of these formulæ work without any liability to stain and exert their reducing action on a print which has been toned in the ordinary gold bath.

* * *

Bas-Relief Portraits. A form of photograph which, from its peculiar character, attracts the attention of the public and, therefore, is of service for occasional window display, is one which imitates in a more or less realistic way the effect of bas-relief. It is very readily made from almost any portrait negative, although really effective results are obtained only from subjects in light tones, such as feminine head and shoulder studies, and particularly those into which lace or other fabric of pronounced texture enters. From the negative a positive transparency is made by contact on celluloid film. The commercial variety of the Eastman portrait film serves very well for this purpose. In the exposure and development of the positive the aim should be to secure density corresponding as closely as possible with that of the negative. After fixing, washing and drying the positive is bound, film to film and slightly out of register, with the negative. The two together then serve as a "negative" either for contact prints or enlargements. Some very attractive results are obtainable by this process, given a suitable original. An example of the method was shown at the last exhibition of the London Salon by Mr. Marcus Adams. There may be a few people, say among the theatrical profession, who will purchase photographs in this style, but, generally speaking, a photographer may reasonably regard the process as one which every now and again may be used to provide a print for the showcase which will attract the passer-by.

QUIET TIMES.

The two months which follow Christmas are generally acknowledged to be the quietest as regards business in the photographer's year, and at the present time this dullness of business is perhaps more noticeable than it has been in any previous year, as we hear of reductions in staff and closing of branches by some of the larger concerns, while there is a general complaint of lack of orders in smaller ones. Many causes contribute to this state of things, which is, of course, due to the general disorganisation of the trade of the country. It would take too long to trace the connection in detail, but the fact remains that portraiture is a luxury trade, and consequently suffers before those branches of commerce which deal with necessities, while commercial photography is more or less dependent upon activity in other trades, and must needs experience the same depression as they do. This reads rather like the talk of Job's comforters, but it is none the less true, and while it is a poor consolation to be told that it is no worse for photographers than for other traders or manufacturers, it is something to be assured that it is no decline of interest in photography that is responsible for our troubles, but simply inability on the part of the public to buy photographs. In one respect the photographer has great cause for thankfulness; he has no heavy stocks to be affected by fluctuations in the market, and he has not such catastrophes to face as the loss of eight millions by a great rubber business from this one cause, or the turning of a yearly profit of over four hundred thousand pounds into a deficit of nearly the same amount on trading in the course of a single year, as recently experienced by a great drapery firm.

It seems therefore that there is no reason to be unduly pessimistic over the future of photography as a business. It is taking its share of the general troubles, and this is less disquieting than a serious slump would be in a time of all-round prosperity. It is to be hoped that in the commerce of the nation this is the darkest hour which comes before the dawn of renewed prosperity; a dawn of which with the eye of faith we already have a glimpse.

The campaign for economy which is now in full swing should have positive results, provided the public does not slacken its demand for reduction of State expenditure. Within a reasonable time, large sums which are now being spent upon unproductive work should remain in the hands of those who have earned them, instead of being taken out of their control in the form of taxes. When it is considered that at least one-third of the total income of the leisured classes is now being absorbed by income tax alone, it is small wonder that these classes, formerly the photographer's best patrons, are not giving orders on the scale of former times. At the other end of the social scale unemployment is rife, and many working classes families have one or more idle members to be kept out of wages which are not too liberal or regular.

The situation should not, however, be faced by merely acknowledging the existing conditions and quietly waiting for things to mend. The less money there is to be spent the greater must be the energy displayed in getting a fair share of it. The most energetic and progressive of our great retail firms recognise this to the fullest extent, and are advertising on a more lavish scale than ever before. The lesson they teach should not be missed by the photographer, who must explore every avenue through which business may possibly come to him. His display should be as fresh and attractive as he can make it, and his old patrons constantly reminded of his existence by letters or circulars announcing his latest introductions, special styles being devised to form an excuse for the communication. The commercial photographer may carry out this idea in a more generous way, as not only may he circularise firms in any line of business who can use photographs, but he can advertise in the various technical journals, particularly those connected with the building and engineering trades. In nearly every other business a large proportion of orders is obtained by direct personal solicitation or "travelling," but we seldom hear of this in photography, except in connection with "shop front" and school work. There is an old saying among business men that a man who spends less upon his advertising than upon his rent is dead to his own interests, but modern experience teaches that the outlay upon advertising should be in a much higher proportion, and it should be carried on persistently and regularly. A small effective announcement which appears regularly will yield a better return than a larger one which appears once or at long intervals. As regards the cost, this may, to a certain extent, be met by delaying the purchase of new apparatus or furniture, which can be procured as soon as the advertising, in whatever form it may take, has done its work. One caution is necessary; it is, not to be discouraged by the non-arrival of orders immediately after an advertising effort; an advertisement is often working months, even years, after its publication. Also, if a good return is apparent from advertising, keep on; do not think that the boom will be permanent. Do not expect too great a return upon the money expended. If orders which can be reasonably attributed to an advertisement pay for it and yield a net profit equal to the amount spent upon it, it is worth going on with, as the indirect influence which is greater has cost less than nothing. "Sweet are the uses of adversity." May the present depression prove a blessing in disguise to those who in the past have waited for business to come to them, but who are now driven to strike out to keep afloat.

THE SCOTTISH NATIONAL PHOTOGRAPHIC SALON.

The exhibition of the Scottish Photographic Salon is held this year at Hamilton, an historic town in the heart of a populous district. The clansmen forming this federation have gone forth in their strength and raided the beautiful glens of their native country and scoured the moors, bringing back much rich booty. The best of the "bags" resulting from these expeditions are shown at this annual Salon. Some 270 pictures have been selected out of 700 submitted. The board of selectors were Archibald Cochrane, Robt. Chalmers, F.R.P.S., and J. Campbell Harper.

The general standard of the exhibition is well maintained, and rivals that of any previous collection brought together by the Federation. The predominating printing process is bromide. In certain instances prints suffer from technical defects due to development troubles, but from those workers who have got a developer to suit the bromide paper they specialise in some beautiful prints result, with often as fine a black as could be desired. The few examples of Bromoil do not show that any particular pictorial quality has been secured by the addition of the oil pigment except in atmospheric renderings.

An outstanding exhibit of fifteen prints of a high quality are sent by Dan Dunlop. If these do not show any further ripening of this artist's powers, his high standard of pictorial output is at least maintained. Hector Murchison submits three pictures, the best being, to my thinking, of "Blakeney Mill" (115). This is a masterly portrayal of a fine subject, the fine atmospheric effect being most striking.

Taking the exhibits in the catalogued order, we remark No. 1 by the secretary, Jas. F. Smellie, a fine print of "Drumadoon Point," of most pleasing quality. "Morning Mist" (6), by Wm. Fraser, whilst a little weak in foreground, has fine quality and very pleasing atmospheric effect. "York Minster" (12), by Thos. Carlyle, shows a rich, strong print marred somewhat by flatness of bars of light on the pillars. "Spring" (13), a Bromoil by Wm. Simpson, has charming atmospheric effect. I think the oil pigment was a helpful contributory in this instance. "A Dream of the Raphoh" (22), by J. M. Whitehead, has this worker's high technical quality; the hard lines of the silhouetted hill are a little harmful to the pictorial effect. "Buist" (25), by J. Lohoar, is a delightful little print, the atmospheric effect being quite charming. The oil pigment has again been helpful. Shall we say, then, Bromoil for aerial perspective and atmospheric effects when foreground is free of ropes and masts? This seems to be the most convincing of the uses of oil pigment additions.

Another very fine picture (29), by J. M. Whitehead, is a print of very rich quality. No. 49, by Mr. McLennan, is in coloured bromoil. The bulk of the coloured work submitted was not acceptable, as prints were in most instances pastel drawings. The coloured Bromoil alluded to above is quite legitimate in method of production; very slight colour has been added to a rich deep brown print, but the gain in artistic value is very slight, if any. "Craigmillar" (57), by Geo. Raeper, is a rich Bromoil print, in which the castle is well presented. "Happy Days" (60), by Linton Gibb, is a very charming little picture, reproduced as frontispiece in the catalogue. In "Joyous Summer" (71), by J. M. Whitehead, I like the higher key which has been struck. This is a fine picture, but I do not much care for the cold bluey colour of his print. The purer blacks of the reproduction in catalogue help to show what this work would gain with a purer colour effect. "The Crooked Chimney" (97), by Chas. A. Allen, is well handled, but the architectural lines are not quite pleasing. "The Cloud" (100), by Dan Dunlop, is a most successful essay, the atmospheric effect being its most successful feature, achieved without the use of Bromoil. "The Muddy Road" (103), by Jas. Lindsay, is a fine quality print. The left hand light reflection is a bit disturbing, and should be further "sunned" down.

"The Great Splendour" (109), by J. Baird, is a most successful essay in recording distance in landscape. I should prefer the retreating distances a little darker, particularly the most distant hills. "A Bridge on the Teith" (114), by W. W. Weir, is a most successful picture, and very originally treated. The big window on the picturesque old bridge is too solid in character and wants breaking up with some scattered lights. "Reflections" (116), by W. R. Fernley, is skilfully handled, flesh tones being particularly well rendered in pr[illegible] light key. "The Leny in Spate" (120),

by John Baird, gives a fine sensation of the rushing waters; it is a print of a fine rich black in bromide. "The Goods Entrance" (123), by A. T. Edgeley, is a clever composition; the nearest figure should be in sharper focus. No. 128, by Chas. Allen, a good subject, suffers from a monotony in the treatment of high-lights of the picture. In No. 131 we see Mr. Dunlop quite successful in seascape, but in No. 162 I do not think he is so successful. Of the riches of light and shade some should have been left out; the composition is "Too Busy." In No. 167 the foreground of seascape is a little gaunt and hard, but in a way this has its use in emphasising the beauty of the distance. To finish with Mr. Dunlop's contributions, I regard "The Palace Courtyard, Stirling Castle" (175), as an excellent piece of work; it has only one defect; this will be discovered if carefully sought by the analytical patrons of the show.

"A Quaint Corner," Culross" (208), is a fine quality print; the composition is odd, but quite pleasing. No. 210, by Mr. Cairns, is a child study happily caught. A "Wilkie-like" subject, "When the Cat's Away" (234), has been very cleverly carried out. "Interested" (236), by John Smith, I consider a most happy performance of decorative design. No. 238 is an excellent portrait of C. Pollard Crowther, Esq., by Mr. Brinkley. No. 243, a sea and sky composition by Miss K. M. Alexander, gives fine rendering on a long scale of delicate tones, a scheme in which photography excels. "Cintra Palace" (244), by A. M. Clark, is a picturesque presentation of pleasing architectural work, most capably carried out. "The Fish Cleaners" (248), by Chas. A. Allan, is a good subject handled in a masterly way.

Robert Chalmers, of Sunderland (his birth certificate is right) shows half-a-dozen prints of his latest and best work. Whilst having a great appreciation of "Youth" (171), I think that the composition suffers from a too central division of the light and shade. "Hilda" (164), by this same worker, is a portrait of a sweet girl, and has a pleasing range of tones. "Framivillgate" (193), is altogether a most satisfying little picture. "Pensive" (197), is in a line Mr. Chalmers has made his own; a very simple and effective portrait.

There is a collection of beautiful work by Marcus Adams, F.R.P.S., sent in response to invitation. Many of the prints are already well known from reproduction in photogravure. I am of opinion that this process of reproduction was responsible for the "too white" high-lights, but I find here in Mr. Adams' work a tendency to use the white paper base in rendering of his many high-lights. No. 280, is a beautiful girl portrait, but suffers slightly from the over-dark rendering of left-hand. No. 279 suffers from a plethora of high-keys. left hand. No. 279 suffers from a plethora of high-keys No. 294 is a charming picture, but the high-lights almost too pure. No. 304, a beautiful boy portrait, in the right key, except for one too white note in collar. These prints sent by Mr. Adams are a great acquisition to the exhibition, and this fine contribution will be much appreciated.

There is a collection in the second hall of Canadian work, and I have been interested to see what kind of pictures our overseas photographic brethren produce, but I am a little disappointed after seeing what their U.S. neighbours have been showing us. Of the work on the wall, No. 301 is a good portrait with some beautiful tone values, but the composition is the worse for the straight white line of arm. No. 324, "A Moment for Thought," appears to be a "gum" print fairly well done. No. 328 is nearly a success, but too broken in the rendering of high-light detail. No. 337, by Mr. Moore, is cleverly done, and has subtle tones happily rendered. No. 348, by Mr. Soulsby, is a pleasing little portrait.

ARCHIBALD COCHRANE.

PARIS NOTES.

The Centenary of Photography.

THE first photographs deserving the name, that is to say, the first images of outdoor scenes obtained by means of a camera fitted with a lens, and of a degree of permanency such that subsequent action of light did not affect them, are certainly the images on metal, glass and paper rendered sensitive with bitumen of Judæ which were obtained by J. Nicéphore Niépce in the years 1822-1824, subsequent to Niépce's earlier experiments in the reproduction of engravings. Following the suggestion made some months ago by the "Revue Française de Photographie," the French Photographic Society, in conjunction with various professional associations, has formed a committee for the commemoration of the centenary of this discovery, and has fixed the year 1924 as the most appropriate time for the celebration. Provided that the plans which are now being made come to a successful issue, an international congress of photography and an international exhibition representing the historical, artistic, scientific, industrial and commercial branches of photography will be held in Paris. The French Academy of Sciences and the Académie des Beaux Arts have already signified their patronage of this programme, and other official support may be counted upon. The difficulty which faces the promoters is that of finding a suitable place providing the accommodation which such an exhibition requires. As soon as the necessary plans have been made, particulars will be forthcoming as regards the congress. The full reports issued of the last international congress held in Brussels in 1910, and published almost in their entirety in the "British Journal," are sufficient to show the importance of a gathering of this kind. A subsequent congress, which was to have been held in London in 1915, in conjunction with the Royal Photographic Society, was in process of organisation when the events of July, 1914, decided otherwise. The French organising committee has still a lively recollection of the aid then offered in Great Britain, and hopes to receive a like support when the plans for the centenary congress are further advanced.

Tests of Process Lenses.

At one of the recent meetings of the photo-mechanical section of the French Photographic Society, M. Démichel, a Parisian photo-engraver, described a very simple method of testing lenses to be used in process work. On the copyboard is arranged a test chart formed by placing side by side a number of prints from the same half-tone block, made with a screen of 150 lines per inch, and the camera extension is set for a reproduction to half scale. Care requires to be taken that the plane of the copyboard and that of the sensitive plate are exactly perpendicular to the optical axis. Any error in this respect is, however, shown by unequal distribution of definition in the image. The average size of the elements of the half-tone original are 1-300th of an inch, and therefore the average size of those of the reduced reproduction is 1-600th of an inch. Any lack of sharpness of the image, even when it is of the order of 1-2500th of an inch (1-100th of a millimetre), sufficiently affects the proportion of the black and white elements forming the screen image to modify in a very marked manner the gradation of the copy, this gradation depending precisely on the proportion of the black (or white) per unit of surface.

M. Démichel has compared in this way an apochromatic Tessar and a Cooke process objective, each of about 25 inches

focal length. Whilst at f/15 the Tessar covered well a 24 × 20 plate, the extreme corners, however, showing traces of astigmatism, nothing is gained as regards sharpness or effective covering power by stopping down. On the other hand, with the Cooke process lens the plate which is sharply covered with a relatively large stop is a little smaller, but a considerably larger plate than 24 × 20 is covered by stopping down.

These data are plainly of value only in respect to the two lenses which were under comparison, but they show the usefulness of this simple method, which can be employed for determining the stop to be used according to the size of plate requiring to be covered when employing any one of the lenses in a process establishment.

It should be added, to avoid misunderstanding, that a test of this kind is not applicable to a lens which is to be used for the photography of relatively distant objects, *e.g.*, landscapes or architecture. A lens, as the result of its corrections having been carried out specially for use on a copying camera, may be perfect for this purpose, but distinctly imperfect for the photography of outdoor subjects; and *vice versa* the corrections of a first-rate lens for outdoor use may prove insufficient for copying work.

A Density Tester for Cinematograph Film Negatives.

In a previous instalment of these notes I referred to the printer of cinematograph films designed by M. L. Lobel, in which automatic adjustment of the strength of the light is made by the passage of the negative film through the apparatus. M. Lobel has now designed a very ingenious apparatus by which the printing value of a film negative may be rated. He calls it the "Etalonneuse Filmograph." In the ordinary way a film negative is rated by eye judgment, with the aid of one or two standard negatives, a method which requires an extremely skilful operator, and even then is liable to error. An alternative method is to test the film negative by printing from it on a few test lengths of positive film under different conditions; then, after development, judging the exposure which should be given. Apart from the considerable quantity of positive film required for this process, the method takes time; and, moreover, is least efficient in these two respects under the conditions most generally prevailing in the making of cinema films, namely, the assembling of many short lengths of negative.

By means of M. Lobel's "Etalonneuse" a series of eight successive exposures are made from a single negative of the film band by successive addition of seven increasing resistances to the electric circuit. The apparatus then comes to a stop, and the negative film can then be unrolled by hand up to the point at which a notch marks the place for alteration in the strength of the light. The machine then starts again, and exposes a new series of eight from the negative presented to it. Thus it is easy, after development of the test positive film, to choose for each section of the negative the conditions of exposure which will give not simply a satisfactory positive, but the best positive which can be obtained from the negative.

A Museum of Cinematography.

M. J. Demaria, president of the Chambre Syndicale Française de la Cinématographie, has recently taken the initiative towards the establishment of a museum of cinematography. Although the industry is scarcely more than 25 years of age, it is one of those in which progress has been most rapid, and a useful purpose would certainly be served, unless it is already too late, by collecting examples of apparatus of all kinds which have been successively employed, abandoned, or, as probably has been the fate of most, sold as scrap metal. The specimens collected for the museum are to be for the present in the charge of the French Photographic Society until their ultimate place of preservation has been decided.

Automatic Timing of Printing Machines.

Clockwork mechanism for the automatic control of the time of exposure in photographic printing appliances has been frequently employed in the past as a means of setting a printer to give an exposure of so many seconds or minutes. The mechanism has been more or less similar to that employed for the lighting of the stairways of flats in Continental cities, by which the dweller, by operating a switch, is given a limited number of seconds to make his way up the staircase to the first landing, there operating a second switch if his flat is higher up. But these clockwork devices are usually somewhat fragile, and will not stand the hard wear to which they are subjected in a photographic printing room. MM. Godefroy Frères have recently introduced a very strong automatic "timer" for printing machines, constructed without any clockwork mechanism, but very easily adjustable over a wide range of exposure times, any one of which can be repeated with great accuracy.

L. P. Clerc.

SOME FACTORS CONCERNING THE RAPIDITY OF A LENS.

[The following is the text of a paper read at a recent meeting of the Croydon Camera Club, where it was accompanied by a demonstration of the apparatus for the direct measurement of the F No. of a lens which Mr. Jobling has designed as an improvement on that of C. Wellborne Piper described in "B.J.," 1917, p. 272. Messrs. Jobling and Salt contrive to convey the facts, and even certain of the more recondite considerations in lens rapidity in a form which involves small sacrifice of exactness for the sake of the elimination of the tabooed mathematical symbols.]

This paper was originally intended and partly written by one of us for an informal summer meeting, since when the subject has been dealt with in a very comprehensive manner by Mr. Geo. E. Brown in the pages of the "British Journal of Photography." A mass of very useful data for the serious student has been brought together by him, some of it perhaps of rather formidable aspect to the average reader. It is to be hoped that the articles, with any additions that may suggest themselves, will ultimately be presented in book form.

The scope of this paper is much more modest, and is intended to appeal mainly to beginners in photography and to others who have never troubled themselves about the simplest problems in optics. Often we find that the men who do the best work know little or nothing about optics, whilst others crammed full of lore do not come up to expectations in practical achievement. Most certainly it is not necessary to be an expert in optics and chemistry to be a first-class photographer, and equally certain is it that a rubbing acquaintanceship with underlying principles need not rob the technician of his technique, or the pictorialist of his inspiration, but should usefully supplement both.

All that will therefore be attempted is to touch upon, in the simplest possible language, the irreducible minimum of what a photographer should know concerning the somewhat dry subject selected, adding thereto some relevant matters of more general interest. The many familiar with the ground traversed

will remember the time when it was unknown and be reconciled to boredom.

Some who practised hand-camera work, before the introduction of the rapid anastigmat, may well be perplexed at the insistent demand by amateurs ever for greater speed in lens and plate. In old days few, if any, lenses of normal focus would cover a plate sharply at a larger aperture than *f*/11, which for that reason was a favourite stop, and the luxury of a rising front was almost out of the question. Nevertheless, with lenses and plates of far lower speed than those of the present day, much first-rate work, even under difficult conditions, was accomplished. Generally speaking the hand-camera then was a heavy and bulky thing, which permitted slow shutter speeds in the hand without risk of movement during exposure.

Excluding the reflex camera, now-a-days weight and bulk have been cut down to such a point as to greatly increase liability of shake during exposure, and in consequence subjects containing nothing in motion often receive what would be considered a top-speed instantaneous exposure in the past. Apart from Press work and sporting events, comparatively few subjects require a shorter exposure than 1/20th or 1/30th of a second, and it should never be overlooked that halving a shutter speed is equivalent to doubling the working speed of the lens, with the added advantage of greater depth of field.

The rapidity of a lens, omitting some qualifying factors, depends upon two main things, one being the amount of the light passed by the stop, the other being the scale of the image —or in other words the size of individual objects depicted, which is dependent upon the focal length of the lens, and must not be confused with the amount of view included on the plate.

As is well known, the area of a circle bears a definite relationship to its diameter. Double its diameter and the area of a circular stop or diaphragm is increased four times, transmitting quadruple the light. Conversely, halve its diameter and the area is decreased four times, and one-quarter the light only passes. Therefore, if any lens is fitted with four stops whose openings have diameters of 1, ½, ¼, and ⅛ inch respectively, exposures will be in ratio 1, 4, 16, 32, or inversely as the square of the diameter of the stop. That is to say, if one second be right for the largest stop, 32 seconds exposure is demanded for the smallest. In practice such a series would present inconveniently abrupt steps.

Beginners occasionally fog themselves by overlooking that ratios are only dealt with in stop nomenclature, and that the proportion that the light passed by one stop bears to the light passed by another, is invariably determined by their respective diameters. In photographic practice it is not necessary to know the actual area in square inches of any stop.

The scale of the image, as has been said, is dependent upon the focal length, or "equivalent focus" of the lens, which is the invariable distance between the focussing screen when a sharp image is formed there of a distant object, and a certain point located inside or outside the lens. This is termed the "principal point" or "node of emission" (in old text books often designated the "optical centre") and its position varies in different lenses.

The scale of the image in conjunction with focal length conveniently forms a starting point to an understanding of the usual method of indicating the relative rapidity of different lenses. Suppose we have two lenses, one of 8 inches and the other of 16 inches focus, both fitted with a stop or diaphragm opening of 1 inch in diameter, which obviously will pass the same amount of light, and with each lens in turn a fairly distant square building is focussed. If with the 8-inch lens the image of the building is reduced in scale to 1 square inch, then with the 16-inch lens the building will be rendered 2 inches square with an area of 4 square inches.

Doubling the focal length therefore gives an image twice linear. The light passed by the stop in this case being distributed over four times the area, at any given point has only one-fourth the intensity of that afforded by the 8-inch lens. To obtain equal rapidity a stop is therefore conditioned that will pass four times more light, which, as we have just seen, is fulfilled by one of twice the diameter or 2 inches across.

The next point to note in the example given is that for equal rapidity the diameter of the stop in each case is one-eighth the focal length. What is true in these two cases is true in all, so that no matter how the focal lengths of lenses may vary, stops having diameters one-eighth of their respective foci will be of the same rapidity, or, in other words, will transmit to the picture plane images of the same light-intensity (or for present purposes must be considered to do so). This being recognised, it will be equally apparent that stops representing any other common fraction of the focal length, such as one-sixteenth, will also give exposures identical with each other.

In the now almost universal method of marking the relative values of different stops, known as the "*f* system," a series of diameters of certain fractions of the focal length is taken, so calculated that each stop is just half the *area* of the larger one immediately preceding it, and thus requires double the exposure.

Naturally, some definite fraction of the focal length must furnish a starting point either for an ascending or descending scale, and in this country one-fourth the focal length has been adopted, usually expressed shortly as "*f*/4." The descending scale is represented by *f*/5.66, *f*/8, *f*/11.3, and other fractions familiar to all as engraved on lens mounts.

To obtain this convenient sequence the diameters of the stops are made proportional to the square roots of the times of relative exposures, namely, 1, 2, 4, 8, and so on in the same progression. But for most practical purposes all we need to remember is that 1.414 (1.4 near enough) is the square-root of 2, for then we can check diaphragm markings, or find the standard *f* values of continental lenses marked differently, sometimes merely with the actual diameters in millimetres of the diaphragms.

Or we can make a set of waterhouse stops to replace ones missing, which is often the case with old lenses picked up second-hand.

To take the simplest case, that of a lens whose largest stop is in the regular sequence and whose *f* value is known—an *f*/8 R.R., for example. Accepting the full opening as correct, and it will probably not be far out, we need not bother about the focal length. We carefully measure the full opening and divide it by 1.414, which will give us the diameter representing *f*/11.3. Half the diameter of *f*/8 will be *f*/16, and half of *f*/11.3 will be *f*/22.6, and so on.

Starting with any other stop in the regular sequence, the same procedure, of course, applies. Thus, dividing the diameter representing *f*/4 by 1.414 gives *f*/5.66, and halving the former gives *f*/8. Quite a simple procedure, and not infrequently of real utility, yet how few, if any, text books written for the less advanced worker condescend to any such plain statement. Parenthetically, it may be remarked that one standard text book written on popular lines describes the *f* system in such terms of incomprehensibility to the unmathematical mind as to amount to positive genius in the traditional scholastic line.

With near objects, which require a greater camera extension than with distant, it will be apparent that the lens for the time being is working at a longer focus and the nominal value of the diaphragm opening is reduced. Particularly is this the case in portraiture and enlarging, and formulæ for dealing with such cases are abundant. Personally, we have never met a photographer who bothered his head one jot about the working *f* value of the lens under these conditions. In portraiture it would hardly be politic to ask a sitter to maintain a pleasant expression whilst the necessary calculations were being made. Estimated exposure based on experience suffices, a more generous allowance being made for large heads than full-length figures. When reducing or enlarging, a table,

ch as the useful one compiled many years ago by the ean Mr. W. E. Debenham, is usually consulted, and saves world of trouble.

In the majority of cases the largest apertures of modern nastigmats do not fall within the standard series. The lative value of any two stops is simply arrived at by squaring th the *f* numbers and dividing the smaller number by the ger, when the quotient gives the relative speed of the larger p with the smaller as unity. Thus, comparing *f*/8 with 3. *f*/8²=8×8=64. *f*/6²=6×6=36. 36÷64=.56. Expo- es will be in ratio 1 to .56.

Prior to the introduction of the anastigmats, the then iversally employed and still largely used rapid rectilinear s has caused its usual maximum aperture of *f*/8 to become mental standard, and most of us estimate the greater speed the newer lenses as in relation thereto. Taking *f*/8 as ity, a table has been prepared which gives nearly all the l apertures of anastigmats on the market.

In the first column the *f* numbers are given; in the second e relative exposures; and in the third the relative rapidities.

aphragm *f* ratio	8	7·7	7	6·8	6·5	6·3	6·2	6	5·8	5·6	5·5	5	4·8	4·5	4·3	4	3·5	3
lative exposure	1	·92	·77	·72	·66	·62	·6	·56	·53	·5	·47	·39	·36	·31	·29	·25	·2	·14
lative rapidity	1	1·1	1·3	1·4	1·5	1·6	1·7	1·8	1·9	2	2·1	2·6	2·8	3·1	3·5	4	5·3	7·1

t will be observed that the aperture *f*/7·7, which looks perior on paper to *f*/8, is practically of the same rapidity. e popular aperture of *f*/6.8 requires about three-quarters exposure, not a very appreciable reduction; the new rmal standard aperture of *f*/6.5 requires less than a third; 6.3 about one-fifth; and *f*/6 one-seventh.

In the case of a landscape lens with the stop in front, as ordinarily used, its actual diameter represents the true *f* ue, whatever its distance. An increase of distance merely stricts the covering power, and, other things being equal, oduces more distortion of straight lines falling towards margins of the field.

Though negative lenses are employed in their construction, lens designed for taking photographs are positive com- nations, an ordinary magnifying glass being a powerful itive lens with aberrations uncorrected, and most of us one time or another have focussed the image of the sun paper for the purpose of igniting it. Here the light from distant luminary falling on the lens in passage through begins to come down until it comes to a focus where it compressed into such a small area as to result in intense t.

In the same way light falling on the front surface of a tographic lens after emergence is cone down or com- ssed, and will pass without loss through a circular aperture of less diameter than that of the front illuminated surface. Consequently, if the stop is of lesser diameter than the lens in front of it, which is almost invariably the case, the effective aperture and *f* value are always greater than a mere measurement of its actual diameter would indicate.

The rapidity of a landscape lens will therefore vary according as the diaphragm is in front of or behind the lens, which is one of a type known as of "inconstant aperture." A practical illustration of this was given by Dr. Zschokke in the "B. J." some years ago in connection with a Goerz "Dagor" double anastigmat, whose two components are of identical focal length.

With the front component used alone in its normal position in advance of the diaphragm, all the image-forming light falling on the front surface of the lens is transmitted through the diaphragm opening of lesser area owing to the coning down of the light, and the effective aperture is *f*/11.8. With the back component used behind the diaphragm, the effective aperture is restricted by, and coincides with, its actual area, and is reduced to *f*/13.6. The brightness of the image in the first case is therefore nearly one and a-half times greater than in the second.

In doublet and other lenses built up of more separated lenses, this coning down of the light may be appreciable or negligible. The well-known Aldis *f*/6 doublet is an example of the former, the actual diameter of the diaphragm being considerably less than the diameter of the incident bundle of light on the front lens' surface—in ratio .87 to 1.00. It is also a good example of a doublet of inconstant aperture, the full aperture of *f*/6 being reduced to *f*/6.9 when the lens is reversed. Inconstancy of aperture may operate as a disturbing factor when copying and enlarging, but otherwise is of little account.

The amount of the coning of the incident light by the front lens is, of course, a measure of its magnifying power, and the magnified image of the diaphragm as seen through the front lens by the eye is the effective aperture. Consequently, if the focal length of the entire lens be known, the effective aperture of the full opening can be ascertained by measuring the diameter of the magnified image. In the same way can be found the actual diameter representing the effective aperture of the largest standard stop, the smaller stops in the regular sequence being determined in manner already described.

VIVIAN JOBBINS,
E. A. SALT.

(To be continued.)

INDUSTRIAL FAIR AT BARCELONA.—The third International Industrial Fair of Spain will be held from March 15 to 25 next at Barcelona. Particulars are obtainable from the Spanish Travel Bureau, 11, Queen Victoria Street, London, E.C.4. A series of special tours is being arranged for the convenience of those wishing to visit other Spanish towns in conjunction with spending several days at Barcelona.

PHOTOGRAPHING SALUTING CELEBRITIES.—In taking up a position from which to photograph a Royal or other procession, the lighting is, of course, the first consideration (writes a correspondent), but there is another important factor to be taken into consideration when in such procession there happens to be a male whose duty or custom it is to acknowledge the salutes of the onlookers, namely, the possibility of the raised hand, arm, or even a hat hiding the face. A number of Press pictures taken of the Prince of Wales in India have been quite spoilt because the exposures were made at the moment when the raised arm, hand, or hat covered the face, and the unfortunate defect is quite common in pictures of other celebrities in this country and elsewhere. Salutes can, of course, never be timed to suit exposures, or exposures to suit the salutes, and in all cases one has to trust to luck—luck which is too often against the operator. Some operators make a point, when possible, of getting to the "still arm" side of the subject when continual saluting is expected, and this appears to be the only remedy. An operator on the saluting-arm side runs a big risk of failure.

B

THE PRACTICAL STEREO PHOTOGRAPHY OF SMALL OBJECTS.

(*Concluded from page* 80.)

The practical outcome of this for the ordinary worker is that when high magnifications are attempted the smallest available stop should be used, and that the near face of the object should be placed exactly in the plane of the verticals on which he has previously focussed sharply with full aperture. Magnifications up to 20 or 25 diameters, which can be secured with a lens of 0.5 in. focus, would be extremely useful in the photography of thin transparent sections of minerals, but great skill will be required to secure the best result—the skill necessary in all microscopic work.

The following comprehensive table, covering a very wide field, sets out in easily available form the results of our inquiry as adapted for use with the suggested 4-in. stereoscope. Its use will be made clear by examples.

TABLE I.

For use with standard stereoscope only. Dimensions in inches.

Image distance ..	12	16	20	24	28	36	40	56	72
Image width ..	7.5	10	12.5	15	17.5	22.5	25	35	45
Print width ..	1.88	2	2.08	2.14	2.2	2.25	2.27	2.33	2.37
Eye separation ..	2.25	2.33	2.38	2.41	2.44	2.47	2.48	2.52	2.53

Magnification									
1..	2.5	3	3	(3)	3	3.5	3.5	(3.5)	3.5
2..	(2)	2.5	(2.5)	3	3	3	3		
3..	2	(2)	2.5	2.5	2.5	3	3		
4..	(1.5)	2	(2)	—	2.5	2.5			
5..	1.5	—	2	(2)	2	2.5			
6..	—	1.5	—	2	(2)				
7..	—	1.5	1.5						
8..	(1)	—	1.5						
9..	1	—	*object width* always $= \frac{\textit{image width}}{n}$						
10..	1	1							
20..	(0.5)	—	*Lens separation* always $= \frac{\textit{Eye separation}}{n}$						
25..	—	0.5							

The figures in the same horizontal line as the number of the magnification give the focal length of the lens to be used, while the corresponding *image distance* is given in the top line vertically above the lens figure. To find the lens required for an image magnified four times at 20 in., we look vertically down from *image distance* 20, and horizontally from magnification 4. The lens required is 2 in. When the lens is exactly correct to formula the figure is enclosed in brackets. In these cases the *object distance* need not be calculated, but is simply found by dividing the *image distance* by the number of the magnification. In the above case, for instance, the *object distance* will be 20 ÷ 4, or 5 in. In general, however, if the worker wishes to avoid trouble, it will be necessary to calculate both *camera extension* and *object distance* from the two formulæ obtained for that purpose, and this is easily done.

$$\textit{Camera extension} = F(1+m), \text{ where } m = n \times \frac{1}{\frac{x}{4}+1}$$

$$\textit{Object distance} = F\left(1+\frac{1}{m}\right)$$

$\frac{x}{4}$ will always be a whole number. Therefore $\frac{1}{\frac{x}{4}+1}$ will be a simple fraction. Multiply this by n, the number of the magnification, and we get m. Put this value of m into the above formulæ, and we have the dimensions required. In the case just considered, where $x = 20$, $n = 4$, $F = 2$: $m = 4 \times \frac{1}{5+1}$, or $\frac{2}{3}$; *camera extension* $= 2\left(1+\frac{2}{3}\right)$, or 3.33 in.; and *object distance* $= 2\left(1+\frac{3}{2}\right)$, or 5 in., which in this case, since 2 in. is exactly the correct focal length, agrees with the value found by simply dividing x by n. It will be seen from the table that the 2-in. lens gives a very useful series of results, many of which are exactly accurate. As already stated, this table is drawn up on strict lines, and the gaps in it may be filled by the use of the lens indicated immediately above or below the spaces without serious loss of accuracy.

For natural size images a 3-in. lens can be used for all distances of the image from 16 in. to 48 in. inclusive unless where very rigid accuracy is required, while a 3.5-in. lens will cover all distances from 30 in. practically to infinity. For images on a reduced scale a 3-in. lens will give all values of n from 0 to $\frac{1}{2}$ at 12 in., and all values of n from 0 to 1 at from 16 in. to 24 in. inclusive. No second lens, therefore, will be needed for this kind of work.

We will now imagine the photographer about to undertake some task by the aid of the table and the two formulæ set out above. The first remark that must be made deals with the artistic considerations that will influence his choice of *image distance*. If his object is 8 in. wide he can show its natural size at 16 in. where *image width* (set down immediately beneath the *image distance* in the table) is 10 in. But it will probably be much better to choose the 20-in. distance for the image, where *image width* is 12.5 in., as this will leave sufficient room on each side for the proper arrangement and display of the object. Or he can show it on the reduced scale of $\frac{1}{2}$ at 12 in., when it will occupy only 4 in. out of the available *image width of* 7½ in. given at this distance. Similarly, if his object is 2 in. wide, he can show it multiplied three diameters at 12 in., but it will be better to choose 16 in. where there is more room. It is not necessary that a small object should be enlarged, provided that its surroundings are properly arranged, as it will simply mean that the central feature of interest in the image will only occupy a small portion of the field—a circumstance which very often has an attractive effect. The worker must exercise the same artistic restraint here as that which prevents him from filling the whole width of, say, a half-plate negative with the photograph of an object which he desires to show in a pleasing way. The first thing, therefore, that the worker must do is to run his eye along the line giving *image width* until he sees a figure amply big enough to give his object room to be properly seen when presented on the chosen scale. Let us suppose, then, that he has an object 2 in. wide, and that he decides to show it multiplied three diameters at 16 in. The table tells him that the lens required is 2 in., and that this is exactly correct to formula, so that *object distance* will be 16 divided by 3, or 5.33 in. The *object width*, or distance between verticals, in all cases will be *image width* divided by n—in this case 10÷3, or 3.33 in. This gives enough room for the arrangement of his 2-in. object. *Print width*, which never varies from the tabulated value, will be 2 in., while *lens separation*, or shift to be given to the camera, will be 2.33÷3, or .78 in. Only one dimension remains to be calculated, namely, *camera extension*. The value of m will be $3 \times \frac{1}{4+1}$, or .6, and *camera extension* will therefore be 2 (1+.6), or 3.2 in. It will be useful to remember that m indicates the ratio of negative to object, or gives the scale of the negative as compared with natural size.

It is taken for granted that the worker has carefully read the practical hints given in connection with the seven detailed experimental cases tabulated earlier. He will then only have to set up his verticals at 3.33 in. apart, adjust the *camera extension* and *object distance* by the lengths found above, and test on the focussing screen the accuracy of the distance between the images of the verticals, which must exactly agree with the *print width* of 2 in. given in the table. If the exposure formulæ are worked out it will be found that for a 1 in. critical depth of focus the stop used should be $F/28$, and that its effective value will be $F/45$, so that this case presents no difficulty. Using this stop, not more than 0.33 in. of the object should be at the near side of the verticals; this, magnified three times, will give the 1 in. image depth in sharp focus at the near side of the principal plane; the remainder of the image will lie at the farther side and will also be critically sharp to a distance of 1 in., and reasonably sharp to a total depth of 2 or 3 in. behind the plane.

We take one more example of a different kind, where n is fractional. Some object, about 30 in. wide, is to be presented on a reduced scale near the eyes—say at 16 in.—in order that its modelling and general conformation may be more clearly seen. (This would seem to be the chief reason why a reduced image may sometimes be desirable.) If n is taken as $\frac{1}{4}$, the image of the 30-in. object will be 10 in. and will quite fill the *image width* available at 16 in. It will be better, therefore, to take n as $\frac{1}{4}$ or $\frac{1}{5}$ —say the latter. The *object width*, or distance between verticals, will then be 10 x

or 50 in., which gives plenty of room for arrangement. The value of m will be $\frac{1}{5} \times \frac{1}{4+1}$, or $\frac{1}{25}$ in. Camera extension, with 3 in. lens, will then be 3 $\left(1 + \frac{1}{25}\right)$, or 3.12 in.; *object distance* will be 3 (1 + 25), or 78 in. *Print width* is given by the table as 2 in. Lastly, *lens separation*, or camera shift, will be 2.33×5, or 11.65 in. If the exposure formulæ are worked out it will be found that the indicated stop for 1 in. depth has the enormous value of $F/2.9$, and that this is practically the same as the effective stop, $F/3$. Great depth of focus and very rapid exposures therefore become possible when the image is reduced. In this case, since $n = \frac{1}{5}$, 5 in. of the object may extend at the nearer side of the verticals. This 5 in. multiplied by $\frac{1}{5}$ will then represent the 1 in. of the image lying at the nearer side of the principal plane. The use of a smaller stop proportionately increases these figures. The exposure data must, however, in such cases be calculated from the formulæ given in Table II.

The great extent of the *lens separation* required in the last example might seem inevitably to lead to distorted perspective, and to result in an image so deformed as to be out of all likeness to the original object. This, however, will not be the case. The perspective effect will certainly be considerably increased because of the small scale of the image and its nearness to the eyes—this, in fact, is the reason for reducing the image; but no matter how small may be the scale, or how wide the consequent *lens separation*, there will be no distortion. A cube, correctly photographed in accordance with the working formulæ, will always remain a cube, and a sphere a sphere. Technical and artistic success in near distance images does not depend at all upon whether they are enlarged or reduced from the object. The danger lies in the fact that the eyes are so sharply converged at these distances that each eye may have a too one-sided view of the image, or that there is not sufficient common ground in both prints, and a very unpleasant effect is produced. As far as possible, the left and right views should not present different facts to the observer, but rather the same facts differently disposed, so that the coalescence of the two may make the whole clear, and allow the points of the image to fall into their proper relationship to each other. In almost every case there will be unavoidable obscurations, and parts of the image visible to one eye will be hidden from the other; but these obscurations, which are sometimes regarded as essential to the perspective relief of the image, are really defects, which it must be the photographer's care to make as few and inconspicuous as possible.

The following table assembles the whole of the working formulæ in their general form, available for use with any stereoscope, and in the order in which they will demand attention.

TABLE II.

Working formulæ giving accurate results by direct printing from the negatives obtained in the camera.

x = distance of image; n = degree of magnification or reduction of the image; f = focal length of stereoscope lenses; OO' = separation of centres of stereoscope lenses; F = focal length of camera lens used; d = depth of focus, or distance of critically sharp definition before or behind the principal plane of the image (plane of *image distance*). S_x = normal separation of eyes when looking at an object at distance x.

1. *Image width* $= OO' \frac{x}{f}$.

2. *Object width* $= \frac{\text{Image width}}{n}$.

3. Focal length of correct camera lens $= \frac{xf}{x + (n+1)f}$

$\left(\text{Ratio of negative to object} = m = n \times \frac{f}{x+f}\right)$.

4. *Object distance* $= F\left(1 + \frac{1}{m}\right)$ when F is any lens.

$= \frac{x}{n}$ when F is exactly correct by formula 3.

5. *Camera extension* $= F(1 + m)$ when F is any lens.

$= x \times \frac{f}{x+f}$ when F is exactly correct to formula.

6. *Print width* $= OO' \frac{x}{x+f}$

7. Exposure formulæ:

Diameter of stop $= \frac{x \pm d}{1200} \times \frac{x}{n} \times \frac{1}{d}$ when F is correct.

F number of stop $= nd \times \frac{1200}{x \pm d} \times \frac{f}{x + (n+1)f}$ for any lens.

Effective F number of stop $= nd \times \frac{1200}{x \pm d} \times \frac{f}{x+f}$ for any lens.

NOTE.—$x - d$ is to be used when d is at the nearer side of the principal plane, and $x + d$ when d is at the farther side.

8. *Lens separation* (camera shift) $= \frac{S_x}{n}$. (For values of S_x see Table I.)

H. C. BROWNE.

FORTHCOMING EXHIBITIONS.

February 11 to 25.—Scottish Photographic Salon. Particulars from the Secretary, James F. Smellie, Braehudon, Allanshaw Street, Hamilton.

February 14 to 17.—Exeter Camera Club. Particulars from C. Beauchamp Hall, Hon. Exhibition Secretary, Exeter Camera Club, 7 St. Denys, Bellevue Road, Exmouth.

February 18 to March 4.—Edinburgh Photographic Society. Particulars from the Hon. Secretary, G. Massie, 10, Hart Street, Edinburgh.

March 1 to 6.—Birmingham Photographic Society. Particulars from the Hon. Secretary, P. Docker, Medical Institute Buildings, Edmund Street, Birmingham.

March 4 to 25.—South London Photographic Society. Particulars from the Hon. Secretary, Harry Abbott, 65, Beauval Road, East Dulwich, London, S.E.22.

March 8 to 9.—Birkenhead Photographic Association. Latest date for entries, February 25. Particulars from the Exhibition Secretaries, Messrs. Longstaff and Trace, 33, Hamilton Square, Birkenhead.

March 14 to 25.—City of London and Cripplegate Photographic Society. Latest date for entries, March 4. Particulars from the Hon. Secretary, J. J. Butler, 1, Gresham Street, London, E.C.2.

March 15 to 25.—Welsh Salon of Photography. Latest date for entries, March 3. Particulars from the Secretary, H. G. Daniel, 153, Penylan Road, Cardiff.

March 16 to 31.—Leytonstone and Wanstead Camera Club. Latest date for entries, February 28. Particulars from the Secretary, Charles Worman, 1, Cowworth Road, Leytonstone, London, E.11.

March 27 to April 1.—Dennistoun Amateur Photographic Association. Latest date for entries, March 14. Particulars from the Exhibition Secretary, Colin Graham, 448, Duke Street, Dennistoun, Glasgow.

March 23 to April 1.—Hackney Photographic Society. Latest date for entries, March 11. Hon. Secretary, Walter Selfe, 24, Pembury Road, Clapton, London, E.5.

April 3 to 8.—Leicester and Leicestershire Photographic Society. Latest date for entries, March 22. Particulars from the Hon. Secretary, W. Bailey, Cank Street, Leicester.

April 24 to May 13.—Hammersmith Hampshire House Photographic Society. Latest date for entries, March 30. Particulars from the Hon. Exhibition Secretary, J. Anger Hall, 26, Bishop's Mansions, Bishop's Park Road, London, S.W.6.

May 1 to 6.—Photographic Fair. Horticultural Hall, Westminster. Secretary, Mr. Percy Brookes, Sicilian House, Southampton Row, London, W.C.1.

September 16 to October 25.—Royal Photographic Society. Latest date for entries, August 25. Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, January 30 to February 4.

APPARATUS.—No. 3,066. Photographic developing and printing apparatus. A. Cigarini.

PLATES AND FILMS.—No. 2,922. Photographic dry plates, films, etc. P. W. Collins.

CAMERAS.—No. 3,118. Cameras. P. W. Maxwell.

DAYLIGHT DEVELOPMENT.—No. 2,886. Daylight developing and/or fixing apparatus for photographic films. F. Nourse.

REFLEX CAMERAS.—No. 3,227. Foldable photographic reflex cameras. B. Foulkes-Winks.

RELIEF IMPRESSIONS.—No. 3,048. Obtaining photographic impressions in relief. F. Nisot.

PROJECTION METHOD.—No. 2,754. Projecting photographic images. K. T. Barlow.

CINEMATOGRAPHY.—No. 2,750. Means for obtaining relief effects in motion pictures. E. Castant.

COLOUR CINEMATOGRAPHY.—No. 2,746. Manufacture of multi-colour screens, films, or plates, for natural-colour cinematography. J. Camiller and A. Hay.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1s. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

FILM-DRYING APPARATUS.—No. 173,919 (October 27, 1920). The objects of the invention are (1) to dry any number of films at the rate of one every 30 seconds, which is even faster than films can be conveniently squeegeed and clipped ready for suspending (2) to be able to place fresh films in without interfering with

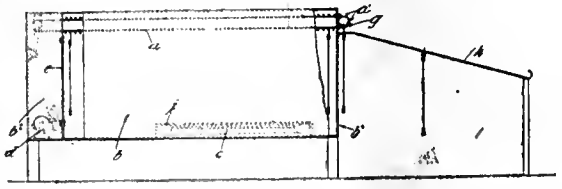


Fig. 1.

those already drying; (3) to take out dried films without interfering with those still drying; (4) to remove dried films so as to do away with an assistant.

A cupboard contains a single moving band for each row of prints being dried, this band being provided with hooks for the reception of detachable clips to which the films are affixed, and a means for automatically detaching the clips and collecting the dried films.

The invention will be described for a cupboard about 15 feet long and 6 feet high.

A short distance from the top is horizontally placed a travelling belt a with hooks a^1 placed every two or three inches, so that approximately sixty or more films will fill the entire length of cupboard.

One end b^1 of the cupboard b, which will be called the exit, is open to allow dried films to pass out, and at the bottom of the

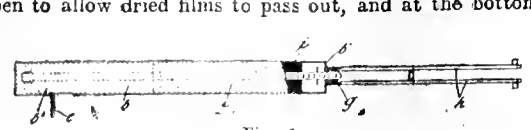


Fig. 2.

cupboard commencing about 2 feet from the exit end b^1 are electric heater units c arranged to spread over about the next 6 feet, and to give a constant temperature of about 95 deg. in the cupboard.

At the admission end b^2 is placed an electric fan d, drawing cold air in at the exit end b^1 over the heater units c past the wet films and out again. Near this end is a fairly narrow door e to allow wet films to be placed on the belt hooks.

It is obvious that this door being open will not upset the temperature of a long cupboard, and hence films can be placed on the travelling belt a at any time without upsetting the drying of others. The fan d is preferably at the bottom of the cupboard, and, as the bottom ends of the films are the wettest, this moisture is removed quickest on account of the warm air being drawn quickly past them, and so even drying is ensured.

Figs. 3 and 4 show a preferable form of film clip: f represents the side arms to the clip, and f^1 the eye of which engages the hooks on the belt.

When the dried films reach the exit end b^1 it is necessary to detach them from the travelling belt a to prevent their being

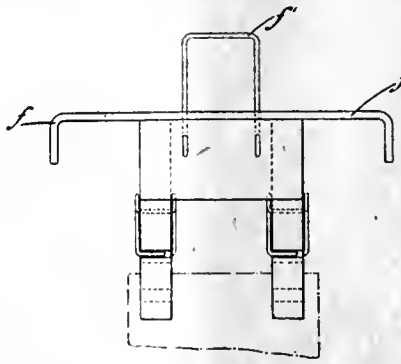


Fig. 3.

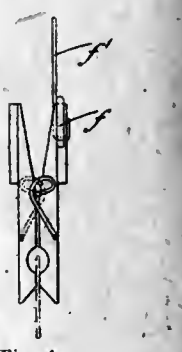


Fig. 4.

carried round the pulleys over which the belt is travelling. This is effected by the film clips catching a bar g which prevents their being carried further by the belt a, and allows and forces them to clip off the back of the belt hook.

The side projections f on the clips drop on to inclined bars h down which the films slide and remain in batches ready for unclipping when convenient.

The belt is driven at any convenient speed, e.g., at the rate of one foot in two minutes, so that 120 films can be dried in one hour, and continuously.

The cupboard is or may be wooden framing, lined completely with any suitable material, and the electric heater units are protected by wire gauze i to prevent an accidentally falling film touching any heated surface.—John Willis Gray, 82, Westborough, Scarborough.

PANEL ENVELOPES.—A correspondent, writing in reference to the ban placed by the G.P.O. upon these envelopes for overseas trade, says: "It was the Madrid Conference that condemned these useful invoice envelopes unless the window formed 'an integral part of the envelope,' the latter pattern being almost entirely of foreign manufacture, and rarely, if ever, used here. The trouble, however, is being overcome, for a British firm of manufacturers (John Dickinson and Co.) have introduced envelopes which conform strictly to regulations, the window in the new pattern being an integral part of the envelope."

HISTORICAL PORTRAITS.—The "Times" announces that the London Library has just received the gift of a collection of engraved portraits and views, estimated to number 50,000, which almost at once puts it on a level with the Print Room of the British Museum. It was formed by the late Mrs. Fraser Baddeley, a life-long collector, and has been presented to the London Library through Dr. Hagberg Wright by her son, Mr. J. F. Baddeley, in memory of his mother, the author. The collection is especially rich in historical portraits, including British and foreign leaders, statesmen, men of letters and science, the Church, and the stage. In London views the collection will probably prove to be one of the most extensive in existence. It is proposed to have the whole of the collection arranged in volumes, the portraits in alphabetical order similar to that of Mr. O'Donoghue's great catalogue of those in the British Museum. The London views will be arranged topographically on similar lines to those in the Croce collection.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, FEBRUARY 20.

Birmingham Photographic Art Club. Enlarging Evening.
Bradford P.S. "Tips and Dodges about Apparatus."
Dewsbury P.S. Y.P.U. Slides.
Glasgow and W. of Scot. A.P.A. Criticism of Exhibition Prints.
Kidderminster P.S. Members' Slides.
Leeds Camera Club. Lecturette Competition.
Morley Photographic Society. Special Lecture by Mr. Dordan Pyke.
Southampton Camera Club. "The Pyrenees." M. O. Dell.
South London P.S. "Velox." W. F. Slater.
Wallasey A.P.S. "Amateur Photographer" Prize Slides, 1921
Walthamstow and Dist. P.S. "Personal Practice in Pictorial Printing." E. C. Perry

TUESDAY, FEBRUARY 21.

R.P.S. "Natural History Photography." G. A. Booth.
Birmingham Phot. Soc. Display of Lantern Slides.
Bournemouth C.C. "A Few Thoughts on Pictorial Composition." Eustace P. Nash.
Cambridge and Dist. Phot. Club. "The Manufacture of Anastigmat Lenses." A. C. W. Aldis.
Exeter Camera Club. Retouching. Technical Demonstration. Fred Walker.
Hackney P.S. "Night Photography and High-speed Photography." P. D. Murchie.
Leeds Phot. Soc. Yorkshire Photographic Union Prints.
Leicester Phot. Soc. "How to Make Enlargements." W. Bailey
Nelson Phot. Soc. "Flower Photography." S. Shackleton.
South Glasgow Camera Club. Contact Print Exhibition.
South Shields P.S. Photographic Apparatus. A. Dordan Pyke.
Stalybridge Phot. Soc. "Java: Its Peoples and Temples" J. Sargent.

WEDNESDAY, FEBRUARY 22.

Accrington Camera Club. "Zeebrugge." James Tonge.
Borough Poly. P.S. "The Preservation of Natural Beauty by the National Trust." S. H. Hamer.
Catford Camera Club. "Wild Flower Photography" H. Pickwell.
Croydon C.C. "Picture Making with a Camera." W. Bullock.
Dennistoun Amat. Phot. Assoc. "Light-weight Camping." Thos. Lochhead.
Ilford Phot. Soc. "Lantern Slide Making." Algernon Brooker
Leicester Phot. Soc. Annual General Meeting.
Partick Camera Club. Tinting Lantern Slides. D. Filshill.
Photo-micrographic Soc. Members' Evening.
Rochdale Amat. Phot. Soc. "Preparing the Exhibition Print." T. Lee Syms, F.R.P.S.
South Suburban P.S. "How a Reflex Camera is Made" W. Butcher and Sons.
Tyneside Phot. Soc. "Carbro." A. Dordan Pyke.

THURSDAY, FEBRUARY 23.

Camera Club, The. "Rise and Progress of Processes in Colour Photography." F. J. Stoakley
Gateshead C.C. "Ideas on Landscape Work." M. Young
Hammersmith Hampshire House P.S. "Details in Photography" Marcus Adams, F.R.P.S.
Letchworth Camera Club. "Colour Photography" F. W. Latchmore.
Liverpool A.P.A. "Modern Brazil: Her People, Resources and Prospects." W. Howarth.
Nelson Phot. Soc. "Through the Grecian Archipelago and the Near East." W. Butcher and Sons.
North Middlesex Phot. Soc. Social Evening.
South Shields P.S. "Carbro." A. Dordan Pyke.
Wimbledon and Dist. C.C. Portraiture Evening and Notes on Portraiture. The President.

FRIDAY, FEBRUARY 24.

R.P.S. "A Pilgrimage to Provence" Hugh Main
Wombwell and Dist. P.S. Amateur Photograph Lantern Slides.

SATURDAY, FEBRUARY 25.

Edinburgh P.S. "A Visit to Italy" T. A. Mowat, C.A

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, February 14, Mr. F. F. Renwick in the chair.

The programme of the meeting arranged by the Scientific and Technical Group, first included two papers by Professor The Svedberg, which were read by Mr. Toy.

In the first paper, "The Reducibility of the Individual Halide Grains in a Photographic Emulsion," Dr. Svedberg described experiments by which he had taken photo-micrographs of the silver halide grain after exposure to light but before development. He had used, for the photo-micrographic illumination, light from an incandescent lamp filtered through double layers of Ilford tricolour red filter and then through Wratten A filter, the combination passing light between 650 and 725. Using the Ilford red-sensitive Special Rapid panchromatic plates, the exposures were not more than two minutes. An emulsion of silver iodo-bromide, prepared by Mr. Renwick, when examined in this way, showed that the percentage of developable grains is not greater when the grains are closely packed together. Other experiments were made in which the sensitiveness of the grains to light was reduced by means of Deensitol. It appeared from the results that no transfer of silver ions takes place from the unaffected to the developable grains, even over extremely minute distances.

The second paper, "On the Relation between Sensitiveness and Size of Grain in Photographic Emulsions," concerned the theorem that there may be emulsions of silver bromide consisting of grains of equal size and shape, but having different degrees of sensitiveness; and, *vice versa*, that emulsions differing in the size and shape of the grains may be of the same sensitiveness. Dr. Svedberg dealt with this question from the mathematical and experimental standpoints. On the assumption that in the light-affected grain there are small centres distributed through the grain, he had calculated by the mathematical laws of chance the percentage probability for the occurrence of a certain number of centres in a given grain. From this theory, he had proceeded to investigate an emulsion prepared for him by Mr. Renwick in which the grains were of almost spherical shape and approximately equal in size, and had found that within reasonable experimental error the centres in light-affected grains were distributed according to the laws of chance. The same conclusion was reached in respect to emulsion exposed to X rays. The paper was a further contribution to the investigation of the ultimate causes which account for the characteristic action of light upon a dry plate.

The papers, or rather the second one, aroused an animated discussion, one speaker declaring that whatever the photographic importance of Dr. Svedberg's observations, the communication was the most important one on the physical nature of light which had been published for a hundred years. It appeared that Dr. Svedberg had shown the existence of a definite physical quantum of light. Dr. Slater Price, while paying a tribute to the importance of the results in the theory of the action of light on emulsions, and also to the author's dexterity in dealing with such problems, thought that more quantitative data were required before the results could be wholly accepted.

Mr. Hickman pointed out that in investigating the action of light on silver bromide grains they assumed either the action of a homogeneous agent on a heterogeneous substance, or, alternatively, the action of a series of discontinuous pulses on a homogeneous surface. He did not think that Dr. Svedberg's results were decisive one way or the other.

Mr. Fry agreed, and Mr. Renwick, while expressing his admiration for the paper, thought that too much emphasis should not be laid on the obtained agreement between experiments and a mathematical formula.

A paper by Dr. S. E. Sheppard and Mr. A. P. H. Trivelli, dealing with the same subject, was taken as read.

Then Mr. R. E. Hickman rose behind a battery of apparatus to describe an optical method of testing plate washers and to give a demonstration of some washing devices. With much humour and in a full vein of engaging candour, he explained that in conjunction with a fellow student, Mr. Spencer, he had been engaged for many months on an investigation of the laws which governed the removal of hypo by washing from gelatine films. The papers of Eder and Warwick which had dealt with this subject were a partial consideration of it. He had started by defining the maximum quantity of hypo which could be left in a film without possibility of harm in the course of time to a given density of film. He gave the series of chemical equations on which this calculation was based, and then proceeded to describe the experimental method which had been used in investigating the degree of speed, completeness, and uniformity with which hypo was washed out by washers of various kinds. In doing this he had sought for a coloured substance which behaved similarly to hypo, so as to replace by a visual or photographic test the necessity of making chemical determinations of the amount of

hypo left in or removed from a film. He had found that pure tartrazine behaved in this way, and all the tests brought before the meeting were based on the removal of the yellow dye from films which had been dyed in it. Roughly speaking, the dye was removed at about one-tenth the rate of that at which hypo was washed out, but it had the great advantage of allowing want of uniformity to be seen and also to be photographically recorded by making a print, through a suitable light-filter, on gaslight paper from the partially washed negative. Adopting this method, Mr. Hickman showed the great irregularities exhibited as regards removal of dye from a single plate when washed in a dish, grooved tank, or by various methods of allowing water to fall directly upon it. He showed that mere soaking was highly inefficient; it was necessary to have a stream of water circulating at considerable pressure in all directions over the surface of the film. He had constructed what he called a "river" washer, in which plates were laid between two low weirs so that they were subjected to a constant stream of water automatically kept at a depth of about a quarter of an inch. He also had devised another most ingenious washing appliance, which he called a "circulator," and which consisted of an arrangement of tubes connected to a water supply one part of which directed a stream of water round and round in a dish and intermittently siphoned off the water delivered by the other part. It could be simply attached to an ordinary developing dish. He showed models made both in glass and metal. Incidentally to his work on the washing of plates he had also devised a most ingenious rocker, which gave an irregularly excentric movement to a platform on which a dish could be laid. It consisted of two semi-spherical rubber bulbs, which were automatically inflated alternately, with the result that the dish was slightly tilted first one way, then in another, in a series of movements which constantly varied in all directions.

The most entertaining paper was followed by a demonstration of these appliances, which kept members crowded round the table until a late hour.

Votes of thanks were accorded to the authors and readers of papers.

CROYDON CAMERA CLUB.

The annual meeting was held last week and a good deal of fun extracted out of what is usually a dull affair. The formal proceedings were short, for the club has made it a practice largely to dispense with votes of thanks to separate individuals, big-bugs and lesser fry being lumped and sugared together.

In briefly reprimanding members for their re-election, the president, Mr. John Keane, and the hon. secretary, Mr. J. M. Sellors, both dwelt strongly on the necessity of new blood in their respective offices, and were the only two in the room of this opinion. Mr. F. Ackroyd still controls the finances, which are in healthy condition.

Inquiries as to what had become of the circulating portfolio elicited the fact that it had been lost sight of for ten months or so. No concern was expressed at the loss of the contents, but the portfolio itself is of some value. It was resolved that the matter be placed in the hands of a member who is on the staff of Scotland Yard. Will the present holder kindly note?

A discussion then arose between the "wets" and the "dry-hards" as to whether the sustenance of guests should be debited to general expenses or to the refreshment account, as is the present practice. Mr. Reynolds pointed out that those members who failed to patronise the side-table and appreciate the lectures escaped any liability, which seemed hardly fair. The matter was ultimately allowed to drop.

For some inscrutable reason summer outings are almost an unknown quantity in the Club, with the exception of the Easter excursion. This is emphatically not what it should be, and another trial is to be made to see if members will respond. Mr. Walker kindly consented to act as excursion secretary.

EDINBURGH SOCIETY OF PROFESSIONAL PHOTOGRAPHERS.

Meeting held Monday, February 6. Present: Mrs. MacKay, Miss Bertram, and Messrs. J. Campbell Harper, Norman Thomson, John Thomson, E. D. Young, William Fergusson, W. B. Hislop, George Balmain, W. J. Hutcheson, George Laing, and P. S. Moffat, Mr. J. Campbell Harper, President, in the chair.

The Secretary submitted the report of the Committee appointed to fix minimum prices for commercial photography. The President stated that the Committee had given this matter their most earnest and anxious consideration, and had endeavoured to grapple with this difficult problem by fixing the minimum prices on what was considered a reasonable, as well as a remunerative, basis. He was convinced that the scheme which they had evolved would go a long way towards the solution of their difficulties, and would be of great value to members in guiding them to make a fair and remunerative charge for commercial work. The question of the prices, with the recommendations, were thereafter freely discussed by the meeting, and the following amplification was unanimously agreed to be made to the latter:—(1) "That a 20 per cent. reduction may be allowed for further views on the same subjects taken in the studio," and (2) "If more than twelve views were ordered at the same time, a special price may be quoted by the photographer." It was also discussed whether the Society could make it compulsory on each member to adhere to the minimum prices. It was pointed out that the Society had no machinery wherewith to enforce their resolutions, but that the prices fixed were recommended merely as a guide to members as to what it would cost to do the work at a fair and reasonable return. Mr. George Balmain, seconded by Mr. Fergusson, moved that the minimum prices for technical photography, apart from portraiture, recommended by the Committee to the Society for the guidance of its members, with the amplification above stated, be adopted, and this was agreed to. It was resolved by a majority to agree to the publication of these prices, which are as follows:—

FOR ONE COPY OF PROOF.

	Outside.	Studio.	Unmounted and Untoned.	Rough Mounted.	Large Mounted.
	£ s. d.	£ s. d.	s. d.	s. d.	s. d.
15 × 12.....	1 10 0	1 2 6	5 0 each	6 3 each	7 6 each
12 × 10.....	1 0 0	0 15 0	4 0 ,,	5 0 ,,	6 0 ,,
10 × 8.....	0 17 6	0 10 6	3 0 ,,	4 0 ,,	5 0 ,,
8½ × 6½.....	0 12 6	0 7 6	2 0 ,,	2 6 ,,	3 0 ,,
6½ × 4¾.....	0 10 6	0 5 0	1 0 ,,	1 6 ,,	2 0 ,,

Time allowed in studio, half-an-hour; exceeding that time, at the rate of 5s. per hour or part thereof. Time allowed for outside work, for first plate 1½ hours, and half-an-hour for every subsequent negative; time in excess of this, at the rate of 5s. per hour. Extra negatives: Studio work, no reduction, but a 20 per cent. reduction may be allowed for further views on the same subjects taken in the studio; 20 per cent. reduction for extra negative on outside work. If more than twelve views are ordered at the same time, a special price may be quoted by the photographers. Stopping out backgrounds, or other extra work on negatives or prints, to be charged at not less than 5s. per hour. Charges for panchromatic work to be left to the discretion of the photographers.

The next question before the meeting was whether it was desirable to hold a Scottish Congress in Edinburgh in 1923. The members were unanimously in favour of the Congress, and also of a photographic exhibition being held. It was urged that the exhibition would prove a great attraction, and would be an effective way of deepening the interest in photography, especially when it was combined with lectures by prominent photographers and a trade exhibition. An effort would be made to secure a large representation of photographers from Newcastle and all over Scotland at the Congress. By this means it was thought that a greater interest would be stimulated between photographers, and by the exchange of views an impetus would be given to the profession of photography. It was agreed to appoint a research committee, consisting of Mr. J. Campbell Harper, Mr. E. D. Young, and Mr. Moffat, to consider the preliminary details and to report at the next meeting.

It was agreed that each photographer be allowed to make his own arrangement for the holiday season.

Mr. Fergusson, in moving that an addition of £3 3s. per annum be made to the remuneration paid to the Secretary, alluded to the time and attention given by him to the affairs of the Society. Mr. E. D. Young seconded, and this was approved of. Mr. Lowson, in thanking the meeting, stated that this mark of appreciation of his services was quite unlooked for. It had always been a delight to him to render any service to the Society whose affairs he had very much at heart.

A vote of thanks to the chairman concluded the business.

ROYAL INSTITUTION.—The Friday evening discourse on February 24, on the "Age of the Earth," will be delivered by Professor John Joly, F.R.S., of Dublin, whose interest in photography has been shown in other directions than the Joly colour process.

News and Notes.

American Portraits for London.—In connection with the Photographic Fair to be held at the Royal Horticultural Hall, Westminster, from May 1 to 6 next, an exhibition is being arranged of examples of modern portraiture by professional photographers in the United States. The organisers of the Fair are offering a thirty-guinea silver cup for the best group of portraits of not more than six pictures. The veteran and accomplished portraitist, Mr. William Crooke, of Edinburgh, has kindly consented to judge the exhibits. Photographers in the United States are invited to contribute towards making this exhibition representative of the best work which is being done in their country. Pictures must not be framed, but may be mounted, although the latter is optional. If, however, prints are mounted the mount should preferably be 15 by 12, 20 by 16, or 25 by 20 inches (in no case larger than the latter), and whenever possible should be white or of light tone. Unmounted pictures will be suitably mounted by the organising committee, and all accepted pictures will be shown under glass. All pictures for the exhibition should reach the organising secretary, Photographic Fair, Royal Horticultural Hall, London, on or before April 10. We have no doubt that many leading portrait photographers in the United States, who from time to time have been glad of the opportunity of showing collections of British work, will avail themselves of this opportunity of making a collective national exhibit for the interest and advancement of the many professional photographers who make it a custom to visit the Photographic Fair.

Messrs. Griffins, Kingsway, London, W.C.2, send us a list of professional goods offered at greatly reduced prices in their annual stocktaking sale. These include mounts, furniture, frames, backgrounds and many professional sundries. Messrs. Griffins also issue a monthly chemical price list, obtainable only by bona-fide professional photographers.

Stabilising the Amidol Developer.—In reference to the article last week, Mr. J. G. F. Druce writes that there is an error in the equation on line 3, column 2 (page 81). The right-hand side of the equation is given twice. Actually it should read:—

$$HO.C_6H_3(NO_2)_2 + 8Sn + 16HCl = HO.C_6H_3(NH_2)_2 + 8SnCl_2 + 4H_2O.$$

Faversham Institute Photographic Society.—An exhibition will be held at the Lecture Hall, East Street, Faversham, from April 5 to 8. There is an open class, in which two gold and three bronze medals will be awarded. Mr. J. Ogden, principal of the Sidney Cooper School of Art, will judge. Prospectus and entry from Mr. W. H. Evernden, 126, West Street, Faversham.

A Keen Motorist-Photographer.—At the Birmingham Police Court last week a motorist-photographer was fined £20 for driving a car to the danger of the public. He was alleged to have crashed into an approaching car, which was smashed, the driver being injured. After the accident he mounted a motor-coach near by, and took snapshots of the wrecked car.

British Industries Fair.—The eighth British Industries Fair will be held from February 27 to March 10 next, and will again consist of two sections, one for heavier metal goods at Birmingham and the other at the White City, Shepherd's Bush, London, W. Over 250,000 invitations to buyers in the United Kingdom have been issued and nearly 50,000 to overseas buyers. Almost every industry in the country, with the exception of textiles, will be represented in the Fair.

Summer Time.—A Bill was presented last week by the Home Secretary providing that Summer Time shall begin at midnight on the night of the last Saturday in March (or the last Saturday but one in March when the last Saturday is the day preceding Easter), and shall terminate at midnight on the night of the first Sunday in October. These dates are fixed in agreement with France and with Belgium, in order to obviate the inconveniences which have been experienced in the past through Summer Time beginning and ending on different days in the different countries. The Bill makes the arrangement, which has hitherto been carried out under Orders in Council, a permanent one.

The Lay Press.—Amateur photographers, who rely, even in part, upon the lay press for technical information, must sometimes have remarkable experiences. A London evening newspaper recently gave the following valuable formula for compounding Farmer's reducer:—

Solution A.	Potassium ferricide	1 oz.
	Water	1 oz.
Solution B.	Hypo	2 ozs.
	Water	1 oz.

It is stated that the silver image of a photograph will gradually disappear when immersed in a mixture of two parts of A and one of B.

The Right Way in Photography.—The right way is a long, long way, if one is to draw any inference from the cover of this new instruction booklet of Messrs. Burroughs Wellcome's, which represents a view of snow and ice in the Antarctic. Such, however, is not the intention of the publishers, who have simply taken the opportunity to use one of the many photographs developed by Mr. Ponting on the South Polar expedition with Tabloid "Rytol." The booklet is a brief instruction manual in development by time and tank with Rytol and in the use of the chromium intensifier. It contains a table of half-tone reproductions showing the latitude in exposure by time development, and also includes an actual negative, one half of which has been intensified with chromium. One of the most helpful manuals issued by Messrs. Burroughs Wellcome, and that is saying a good deal. It is obtainable free on application to Snow Hill Buildings, London, E.C.1.

Mr. Pirie MacDonald, of New York, whose cards of Christmas and other seasonal greetings are invariably little doses of stimulant (we hope the word will not inspire vain regrets at his fireside), recently sent us the photograph which we reproduce. Mr. MacDonald is on a fortnight's holiday in the Adirondack Mountains, the resort for winter sports in the northern part of New York State, where the temperature may be 20 degrees below zero. However, the keen, dry air and the continuous sunshine are together a tonic which gives the visitors to the heights the energy which carries them through the frequently trying heat of the New York summer.

History Cinema Films.—An interesting experiment in the teaching of history by means of the film is now being undertaken in the United States under the supervision of the Yale University Press. According to the "Times" correspondent, a hundred reels of film depicting American history are to be produced by a new organisation called "The Chronicles of America Picture Corporation," which has been organised for the purpose. These reels will be grouped into coherent phases of American history, and every important stage in the development of the country is to be dealt with. The whole work will be carefully supervised by the Yale University Press. Under the direction of the Yale University Press preliminary work for the production of these films has now

been taking place for two years. It is hoped that these "Chronicles of America Pictures" will serve as a useful help to teaching. They are not intended in any way to supplant existing methods of instruction, but to assist them. Above all, their aim is to inculcate ideas of good citizenship.

THE HISTORY OF FALLOWFIELD'S.—Few firms in the photographic trade can look back upon so long a period of continuous activity as that of Jonathan Fallowfield, of 146, Charing Cross Road, London. Established in the year 1856, in Lower Marsh, Lambeth, by the late Mr. Fallowfield, it quickly took a leading place in the supply of requisites for the wet-collodion process, and for the other then current photographic methods. Since that time it has preserved a record of enterprise in the supply of the latest requisites for all branches of photography. Messrs. Fallowfield have recently had the happy idea of bringing together in their window a collection of bygone price lists and advertisements, of great interest to those who have a liking for looking back upon the steps which photography has traversed. Perhaps the most notable of these are the drawings by Carruthers Gould, which were made for the advertisement of the "Facile" hand camera, introduced by the firm in the year 1889. For the "Facile" may, we think, be said to have been the real pioneer among hand cameras. A glance through the "B.J. Almanac" for 1890 shows that the common idea at that time among manufacturers was to put a camera of the stand pattern in a box, as much for the purpose of disguising it as for the facilities which are now universally associated with the hand type of camera. The "Facile," on the other hand, was a quite different conception, the plates being carried in an upper magazine, and being transferred after exposure to the lower part of the apparatus. It is interesting to see in Messrs. Fallowfield's window some framed P.O.P. prints from "Facile" negatives still, to all appearances, as fresh and bright as when they were made. The 1890 catalogue of Messrs. Fallowfield, which contains a detailed description of the "Facile," is a volume of 430 pages, on the back cover of which is reproduced one of the most famous of Sir Carruthers Gould's drawings, namely, that of Lord Randolph Churchill waiting at a corner for Mr. Gladstone to come within the field of the lens.

Commercial & Legal Intelligence.

EASTMAN KODAK COMPANY.—In addition to the usual quarterly dividends of 1½ per cent. (being at the rate of 6 per cent. per annum) upon the outstanding preferred stock, and of 2½ per cent. (being at the rate of 10 per cent. per annum) upon the outstanding common stock, the directors have declared an extra dividend of 7½ per cent. upon the common stock, all payable on April 1 to stockholders of record on February 28.

LEGAL NOTICES.—At an extraordinary general meeting of the Photo Printing and Publishing Co., Ltd., a resolution was passed to the effect that the company be wound up voluntarily, and that Charles Edgar Willbourn, 120, Carlton Vale, Kilburn, N.W.6, be appointed liquidator.

Notice is given that the creditors of the Langham Studio, Ltd. (in voluntary liquidation), are required, on or before March 7, 1922, to send in particulars of their debts or claims to Kenneth Alfred Edgar Moore, chartered accountant, Thames House, Queen Street Place, E.C.4.

At an extraordinary general meeting of the members of the Lonsdale Process Engraving Co., Ltd., held at the registered offices, 27, Chancery Lane, W.C.2, a resolution was passed to the effect that the company be wound up voluntarily, and that Mr. Charles Glyn Read be appointed liquidator.

NEW COMPANIES.

TURNER & HOW, LTD.—This private company was registered on February 2, with a capital of £500 in £1 shares. Objects: To take over the business of a photographer and photographic dealer, carried on by F. Turner, at 67, Park Lane, Leeds. The first directors are: F. Turner, 9, Ashville Avenue, Cardigan Road, Leeds; R. H. How, 119, Cardigan Road, Leeds. Qualification: 10 shares. Remuneration as fixed by the company. Secretary: E. Spence. Registered office: 67, Park Lane, Leeds.

C. A. BURDETT (CHEMISTS), LTD.—This private company was registered on January 30, with a capital of £300 in £1 shares. Objects: To acquire the business carried on at 14, Regent Street, Dawlish, Devonshire, and to carry on the business of chemists, druggists, opticians, dealers in photographic supplies, etc. The first directors are: H. F. Stapley, 45, Craven Road, Hyde Park, W.; C. A. Burdett, 14, Regent Street, Dawlish. Qualification: 1 share. Registered office: 14, Regent Street, Dawlish, Devon.

INDUSTRIAL INTELLIGENCE, LTD., has been registered as a company limited by guarantee, without a capital divided into shares. The objects are: To promote publicity and propaganda of all kinds, especially such as may be calculated to foster production, manufacture and trade in and between all parts of the British Empire and other countries; to promote and assist the production and distribution of literature, printed matter, photographs, illustrations and advertisements, and billposting of all kinds; to organise meetings, lectures and exhibitions; to establish and conduct commercial agencies, etc. The company is to be governed by a council of not more than six members, two being elected annually at the general meeting and one nominated by each of the following bodies:—The Federation of British Industries, the British Electrical and Allied Manufacturers' Association, the Cable Makers' Association, and the British Engineers' Association. The first members are: Llewellyn B. Atkinson, Alster, Little Hampden, Great Missenden, Bucks., electrical engineer; Roland T. Nugent, 21, Egerton Gardens, S.W.3, director, Federation of British Industries; D. A. Bremner, 9, Rossetti Garden Mansions, Chelsea, S.W., director, British Engineers' Association; and D. N. Dunlop, Onslow Village, Guildford, director, British Electrical and Allied Manufacturers' Association. Each of the above-mentioned organisations shall be entitled to become the first "Association" members without election, and the signatories to the Memorandum of Association the first "ordinary" members. The registered office is 24, Chancery Lane, W.C. The file number is 179,507.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertoke responsibility for the opinions expressed by our correspondents.*

FILM SPEEDS.

To the Editors.

Gentlemen,—Is it not time something was done to indicate more accurately the speed of films? Those who use plates, can rely (more or less) on the "H. & D." or "Watkins" figures, printed on the containing box. In the case of films the only guides are such words as "speed films," "as fast as the fastest," "super speed," "double instantaneous," and so forth, vague in the extreme and reminiscent of the early days of the "dry plate." Cannot film makers conform to the modern practice, and give speed figures which would, at least, be of some value for the purpose of comparison? The recent introduction of several new roll-films seems to make a departure from the present slip-shod manner of suggesting speeds particularly desirable. Even the amateur is now largely "educated up" to the point at which a knowledge of the speed of emulsions is a matter of vital interest.—Yours faithfully,

LYULPH LUMLEY.

Automobile Association, Coventry Street, London, W.
February 10.

CO-OPERATIVE ADVERTISING OF PHOTOGRAPHIC PORTRAITURE.

To the Editors.

Gentlemen,—It is with great interest that I read your article "More Business in Portraits." This co-operative advertising appeals to me strongly, as I believe it would stimulate portrait photography to a marked degree.

This matter has received my careful consideration, and I feel convinced that it is within the bounds of practical politics.

I was so impressed with the value of co-operative advertising that some years ago I submitted a scheme to the Council of the P.R.A. They, however, advised me that my scheme was not practicable.

This matter, I think, can with advantage be aired in the correspondence column of your paper.—With compliments, yours faithfully,

Canterbury, February 13. W. FISK-MOORE.

INVENTIONS IN COLOUR PHOTOGRAPHY.

To the Editors.

Gentlemen,—After reading Mr. Ives' letter dated January 7 I am tempted to ask, What is a discovery and what is an invention?

The analysis of light and the isolation of its elements, the investigation of the part these play in relative admixture or combination in producing the visible object in respect of the form and colour, are in the domain of physical discovery. The utilisation of reflectors, screens, prisms, or other optical apparatus to effect separation of the elements of light, and their recombination so as synthetically to reproduce the visible object, are in the domain of invention. But neither the general optical knowledge nor the well-known appliances in themselves constitute the invention in which they are employed.

Their employment may be common to many independent inventions; their particular and specific application as a means of effecting a required result is the actual invention. Both the optical knowledge and appliances used in tricolour photography long antedate the various apparatus employed to secure photographic colour reproduction. The fundamental ideas underlying all current practice are by no means new. They were not originally announciated by Mr. Ives, and Mr. Ives' application of them by no means exhausts their utilisations.

Some twenty years before Mr. Ives applied for his patent M. Louis Ducas Du Hamon had used these fundamental ideas in a patent for "Improvements in photography in colours and in apparatus for that purpose."

But they established no claim to originality, and least of all to an exclusive proprietorship in their employment.

Mr. Ives' invention of the Kromskop was an application of the principle, not less ingenious because previously used. As a practical fact the Kromskop was a viewing instrument, not a taking camera, and calling it a camera did not make it one.

While expressing my deepest admiration for Mr. Ives' invention, which gave results in viewing that never have been, and probably never will be, surpassed, it advanced nothing in overcoming the essential difficulties in the construction of a taking camera. The production of negative images of identical size and focus, correct as to colour values, practically correct as to relative densities, and produced simultaneously, was not, so far as I am aware, even attempted in the Kromskop. Other patents for similar inventions, all using the same principle, were granted immediately before, simultaneously and subsequent to my own application. I do not know if any of these have succeeded practically in doing what it was the object of my invention to accomplish, but I believe I can safely assume that neither Mr. Ives nor anyone else has ever produced in the Kromskop, even though fitted with plate holders as Mr. Ives suggests, three simultaneously exposed negatives capable of being used for correct colour reproduction.

Mr. Ives says: "Making tricolour cameras register is one of the simplest problems I have had occasion to attack." So far as this applies to the Kromskop, I agree it is very simple. In the first place, the positives which produce the images may be printed from colour screened negatives of identical size, produced either simultaneously or successively. The images of these are superimposed in an instrument such as the Kromskop adjustable both for the position of the "colourgram" positives and the reflectors, and with these conditions it is a simple matter to register the images where the eye exercises a continuous check over their movements.

It is quite otherwise in a taking camera, where a number of factors have to be co-ordinated in a structural adaptation which necessarily is fixed and permanent.

I claim that I have in a practical manner, in my single exposure tricolour camera, devised a means that will, under correct conditions of light and with suitable sensitive plates, fulfil the conditions above set out, and which no proper use of language could describe as "a patent on the Kromskop."—Yours faithfully,

EDWIN T. BUTLER.

26, Craven Park, Willesden, London, N.W.10.

EXPERIMENTS WITH FOLIO-BROM.

To the Editors.

Gentlemen,—In the practice of photography it is sound wisdom to stick to one plate and one paper, at any rate it is a sure way to avoid failure.

When I opened the first of three packets of the Folio-Brom stripping negative paper, which I bought recently, I was doubtful. However, I put them in my slides, same as a plate with a cardboard backing, and then marched out to expose them on a paying job. In the dark-room I just took the ordinary developer, pyro-soda, with a few drops extra bromide, and to my surprise they came up like a good, sound, dry plate. I fixed, washed, and dried them as instructed, and when dry they stripped from their support quite easily, with good detail and good density for bromide paper.

But, by some means or other, one of the films got wet and cockled badly, and was quite useless for printing. After a little consideration I cleaned a whole plate glass and put the film in a dish of clean water, and with a little dodging I at last got the film flat on the glass. At this stage the film is so delicate that it requires careful handling. When right on the glass, take a roller squeegee, and carefully roll out the surplus water with blotting-paper. Put up to dry, and you will then have a 7 by 5 negative instead of a half-plate.

The negatives can be easily intensified with mercury and ammonia, and when dry will leave the glass clean and flat.—Yours truly,

HENRY HOLMAN.

Banff, February 8.

PRICES OF PHOTOGRAPHIC MATERIALS.

To the Editors.

Gentlemen,—We are writing to ask you to kindly bring forward the question of the current prices of photographic plates and papers. We are consequently losing business owing to the high prices we are compelled to charge for our work, and in order to encourage a revival we shall have to very much reduce the price.

We find that no reduction in price has been made on bromide papers since February 10, 1920, and in plates since March 12, 1921.

We are large purchasers of papers, gelatine, and silver salts for other purposes, and we find that the cost of these three articles, which are the main ingredients of our sensitising materials, has come down enormously since the above-mentioned dates, and it is high time the plate and paper manufacturers reduced their prices accordingly. Everything else we buy in a business covering many departments has been reduced several times since the above dates, and surely the plate and paper manufacturers must, in their own interest as well as ours, come into line.—Yours sincerely,

ENTWISTLE, THORPE AND CO.

42, Deansgate, Manchester.
February 13

PHOTOGRAPHY AT THE ROYAL WEDDING.

To the Editors.

Gentlemen,—Owing to my association with the late Sir Benjamin Stone in obtaining the Abbey photographs of His Majesty's coronation ceremony, I was interested in your article in to-day's issue of the "B. J." regarding the photographic arrangements for the forthcoming Royal Wedding.

At the time of the coronation His Majesty was most anxious that the solemnity of the service should not be disturbed by unsightly cameras, therefore, both camera and operator had to be screened.

After experimenting for quite a month before the event, it was found that the fastest plate procurable at the time would require not less than five seconds exposure, owing to the very meagre

amount of light filtering through the grimy stained-glass windows in the Abbey.

It is a matter for congratulation that British plate makers have greatly improved on the speed of plates since then.

The arrangements for supplying the Press with prints for publication purposes in the shortest possible time will, I think, take some beating. The first photograph of the proceedings (procession of the crown jewels) appeared in the newspapers which were being sold in the streets at the moment the King was leaving the Abbey, after the proceedings. Special trains were chartered to take the prints to the North, in order that the northern newspapers could publish the principal views simultaneously with the London papers the following morning.—Yours faithfully, WM. RANSFORD.

Belsize Park Studio, N.W.3.
February 10.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

W. J. H.—We thank you for your letter, which we have sent on to the inquirer.

N. N.—We do not know of any practical method for printing out on bromide paper and fixing the prints. We daresay some kind of an image can be got by soaking the bromide paper in potash nitrite solution and printing out. But whether the image so obtained will stand fixation in hypo we do not know. We very much doubt if it will.

P. F. R.—About the best method of rendering paper negatives semi-transparent is to iron pure paraffin wax into them with an ordinary domestic iron. Another method is to soak in a mixture of castor oil and alcohol (or ether), the ether or alcohol evaporating and leaving the oil in the paper. Both methods are troublesome and rather messy, and, moreover, will not give the degree of transparency obtained with the thin paper of the envelope which you send owing to the presence of the somewhat opaque baryta coating on the emulsion paper.

O. B. E.—There have been a considerable number of patents for processes of stereoscopic cinematography, or rather for producing a species of pseudo-relief by cinematograph projection. We think if you wish to ascertain what has been done the only course for you is to examine these specifications, for which you would require to trace the subject-matter by means of the classified abridgments of patent specifications, published by the Patent Office, 25, Southampton Buildings, London, W.C.1. On page 416 of the current "B. J. Almanac" you will find a brief account of some recent inventions.

H. H.—There is little to choose between the lean-to and ridge roof style of studio, but on the whole we think the latter preferable it will look better inside, and as the angle of the glass will be more acute there is less likelihood of leakage or lodgment of snow. For so narrow a studio it will be very desirable to have a height of 8 ft. to the eaves, this will only just allow a standard 8 x 8 background to be used With lower sides you would find the angles coming into the picture when taking groups. For artificial lighting two 1,000 and one 2,000 c.p. half-watt lamps should be sufficient.

L. S.—We do not think there is any way of producing identical focus for the apparatus you describe under the two conditions, owing to the alteration of the length of rays from the original by passage through the prism. This alteration will be slightly different for every different degree of reduction. It might be possible to draw up a table for the setting of the lens front and back frame of the camera corresponding with different degrees of reduction and according to whether you use the prism or dispense with it, but we should think this would be an unsatisfactory system in practice and liable to lead to negatives defective through unsharpness.

S. G.—For toning with Schlippe's salt prints are bleached in the customary mixture of ferri-cyanide and bromide, as used for sulphide toning, and after a few minutes' washing are treated with a solution of 5 grs. Schlippe's salt in 10 ozs. of water. The worst of this process is that it is rather erratic. The Schlippe's salt should be of the best quality and of comparatively fresh make. Even then it does not keep very well either in the solid state or in solution. If you add about 20 drops of strong ammonia solution to the above Schlippe's toning bath the tone is somewhat darker and a purer warm brown. We think this is a better tone than the reddish, and is obtained with rather more certainty. Many people now, we believe, prefer to get a red tone by toning a sulphide toned print in a bath of sulphocyanide and gold. Instructions are contained in a booklet which Messrs. Wellington & Ward send free on application.

W. T.—(1) It looks as though the formula you are using does not contain a sufficient quantity of water, at any rate for use under conditions where the temperature is liable to fall below 60 deg. We advise you to make up the formula with double the quantity of water, using double the quantity of this stock solution in making up the working developer. A developer of this kind, which has once thrown down a deposit of developer base, is not very easily got into working condition again. All you can do is to add, say, an equal bulk of water and keep the mixture somewhere where the temperature does not fall, say, below 75 deg. F., shaking or stirring the mixture occasionally. (2) Bromide prints ought not to alter in the way you describe, if they do we should look for insufficient fixation as the cause. Water-colours, if of good quality, ought to be quite permanent for months in very much brighter weather than that prevailing at the present time of year.

L. L.—The arrangement entered into between yourself and the editor appears somewhat vague. You appear to have agreed to do the work and supply prints on the speculative basis that you should be paid your share of the reproduction fees paid by other newspapers. If that is so, there would be no objection to your sending prints for reproduction, but your "customer" (we mean the editor) would then, of course, ask for his share of the profits Really the matter ought to be decided by the answer which you can make in your own mind to a question such as this:—Did or did not the editor give you an order to take the subject, for which order you expected to be paid by him, and in respect to which he understood he would have to pay? If you did get such an order then the copyright is solely the property of the editor, and he can do what he likes with prints which you supply to him at a price. But if there was no such order, and in the absence of any other definite arrangement, the copyright is yours, and you can do what you like with the photographs as regards canvassing for reproduction fees and taking them. We are afraid we cannot write more plainly from the information supplied.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. PRICE FOURPENCE.

TERMS OF SUBSCRIPTION POST FREE.

UNITED KINGDOM OR CANADA.—*One Year*, £1 1s. 8d.; *Six Months*, 10s. 10d.; *Three Months*, 5s. 5d.

ANY OTHER PART OF THE WORLD. *One Year* ..... £1 3s. 10d. *Six Months* ... 12s. 0d. *Three Months* 6s. 0d.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibits the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

HENRY GREENWOOD & Co., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3225. Vol. LXIX. FRIDAY, FEBRUARY 24, 1922. Price Fourpence.

Contents.

SUMMARY

In a paper from the Eastman Research Laboratory Mr. E. R. Bullock describes some very interesting observations on the convection current set up in solutions during the action of bleaching solutions, and also in the operation of the fixing bath. He describes an ingenious means of rendering these currents visible, and shows how they account for certain irregularities in the action of solutions. A further conclusion is that a plate is fully fixed as soon as the white silver bromide has disappeared. (P. 110.)

In a leading article we refer to the method of investigation which has been followed by Mr. Bullock. (P. 107.)

In the further portion of their paper on the rapidity of a lens Messrs. Vivian Jobling and E. A. Salt describe a modification of the appliance for the direct measurement of the relative working aperture or F. No. of a lens. (P. 108.)

Formulæ and working details have been given by Mr. W. T. Wilkinson of an improved form of the wet collodion process in which the iodide in the collodion is replaced by a mixture of chloride and bromide. (P. 112.)

The practice of photo-micrography is very greatly simplified to the beginner by means of an attachment to the ordinary camera, yielding excellent results up to magnifications of about 100 diameters. (P. 106.)

Particulars of the committees entrusted with the organisation of the congress and exhibitions to be held by the Professional Photographers' Association next September will be found in a report of a council meeting on page 118.

Bulgaria having subscribed to the Berne copyright convention the 1911 Copyright Act has been extended to Bulgarian nationals by an Order in Council. (P. 119.)

The first issue of a French journal of theoretical and applied optics has been published. (P. 119.)

Publication of the Austrian journal, "Photographische Korrespondenz," has been suspended for the present year. (P. 119.)

A quartz electrical resistance in a metal casing forms a convenient means of bringing fairly large quantities of developing solution quickly to a required temperature. (P. 105.)

Constructional details of a printing frame for making a considerable number of reproductions from a single negative are given in a recent patent specification. (P. 115.)

In a paragraph on page 105 we refer to the convenience of the vertical camera for occasional copying both of flat originals and small objects.

Such very large apertures as $f/1.5$ can seldom be used on outdoor subjects with lenses of considerable focal length, such as 12 in. or so, or even with those of shorter focus on reflex cameras. (P. 106.)

EX CATHEDRA.

A Developer Heater.

We see mentioned in the French photographic papers an appliance which has been put on the market by a Besançon firm for bringing considerable bulks of developer or fixing solution, such as are used in the handling of amateurs' film negatives, to a suitable working temperature. The appliance consists of an electrical resistance made of quartz and mounted in a cylinder of nickelled metal. It is provided with terminals which are connected by a length of flexible cable to any ordinary lamp holder. On the current being switched on and the solution stirred with the heater the temperature is quickly raised. In fact, according to the description in our French contemporaries, the appliance suffices to bring a moderate quantity of water to nearly boiling heat in about ten minutes, and thus serves the additional purpose of providing hot water in making up stock solutions in quantity without the inconvenience of heating the water over a gas burner. A miniature appliance of this kind, for bringing a few ounces of water to boiling heat, is a familiar article in the electrical shops, and possibly the larger heater which we have described is made in this country, although we have not heard of it.

* * *

A Vertical Copying Camera.

For the odd jobs in the way of making copies of old photographs and other originals which are brought to a studio by customers, the convenience of a vertical arrangement of a special camera deserves to be given more attention than seems often to be the case. A copying outfit of this type may be kept at hand ready for use, and then needs only to be placed where it will get the light from a side window. Illumination under these conditions is particularly good, and if the camera is provided with one or two extra lens panels, permitting the use of several objectives of different focal lengths, almost any ordinary degree of reduction can be obtained without trouble. The horizontal easel on which originals are made may be a flat board covered with cork lino, to which a mounted or unmounted photograph or print is quickly attached with one or two glass push pins; or it may be a glass plate on which the original is laid and kept flat by placing a second glass plate upon it. The latter plan is of particular convenience in using the apparatus for photographing small solid objects—coins, geological specimens for example—since it allows of any appropriate background being provided by arranging a suitable sheet of mounting paper a few inches below the glass easel. In this connection it may be useful to refer to the employment of a ground glass easel for the reception of such specimens, the ground glass forming the top of a box containing some electric lamps by which the "background" can be given such strength as to obviate blocking out, whilst, at the same time, details in the photograph may be almost completely washed

Long-Focus Lenses. The purchaser, whether amateur or professional, of a long focus lens for outdoor use, is apt to cast envious eyes upon the instruments of large aperture, such as *f*/4.5, which are catalogued by the opticians. Those, however, who have had much experience in the use of ultra-rapid lenses of considerable focal length relatively to the size of the plate which is to be covered, know that the opportunities for using such lenses at the full aperture are comparatively few and far between. For the sake of depth of focus most subjects require the aperture to be reduced to *f*/6, *f*/8, or even still smaller, so that the money which is spent on the extra cost of obtaining the very large aperture can be employed only in infrequent circumstances. Generally speaking, for stand cameras for outdoor subjects, there is very little utility in purchasing a lens of focal length 12 inches or more which is of larger aperture than *f*/6 or even *f*/8. If the lens is also to be used for portraiture in the studio, the circumstances are of course somewhat different, and the facility of short exposures justifies the expenditure on a large maximum aperture. Even when we come to lenses of shorter focal lengths employed on smaller cameras the same considerations largely hold good. For example, a 7-inch *f*/4.5 lens on a quarter-plate reflex is certainly a de luxe fitting which on occasion can render valuable service. But in regular use its owner will find himself almost invariably compelled to set the diaphragm down to *f*/6 or *f*/8, and perhaps on the whole will hardly consider himself repaid for the greater cost, weight and bulk of his instrument.

SIMPLE PHOTO-MICROGRAPHY.

Photo-micrography can hardly be described as a popular branch of photography, although there is an active Photo-micrographic Society, and probably a good many workers in the provinces who do not belong to that body are fully qualified by competence and keenness for membership. Unfortunately, apart from the fact that advanced photo-micrography requires a good deal of patience and skill on the part of those who practise it, there is now one particularly solid reason why it does not appeal to any but the comparatively few, namely, the costliness of high-class apparatus. Where the higher powers are in question, as they must be, for instance, in a large proportion of medical, biological, and botanical work, not only is it essential that the microscope itself and the eyepieces and objectives should be of first-rate performance, but also the photographic arrangements must, if the best results are to be attained, be of a special description in order to secure adequate rigidity, accuracy of alignment, and satisfactory illumination. Even when only moderate powers are attempted, and an ordinary camera is mounted for photo-micrographic use upon a simple baseboard, with a plain bullseye as condenser and incandescent gas as illuminant, the outlay is considerable, if a microscope has to be procured at the price now ruling for such instruments. There are microscopes and microscopes, of course, but a big hole is made nowadays in twenty pounds by a first-class stand with inclinable tube, a couple of oculars and objectives of low power, and a few simple accessories..

This, we repeat, is unfortunate, for photo-micrography is an extremely interesting and useful pursuit enabling photography to be profitably applied in a number of fresh and often really important directions. Moreover, an immense amount of good work can be done at powers very much lower than those required for purposes of special scientific research, and without any wide knowledge of microscope technique. It is probably safe to say that the great majority of specimens such as are usually mounted for microscope observation belong to one of two classes, namely, those which cannot be satisfactorily examined with powers under × 500, and those for which powers ranging from × 20 to × 150 are amply sufficient. For the former, the photo-micrographer must have a microscope and a suitably-mounted camera in order to obtain really good results, but for objects such as can well be examined with 1-inch or ½-inch objective and an appropriate eyepiece a simple attachment to the camera is quite practical, and one or two arrangements of this sort have, in fact, been designed. An up-to-date attachment, which is described and illustrated in another column, is that put on the market by Messrs. James Swift & Son, whose microscopes have a world-wide reputation, and who, we may be sure, would not have given their name to the instrument under allusion unless it satisfied exacting requirements in the way of precision and efficiency. It will be specially noted in connection with this simple little instrument that there is no optical departure from the system pursued with microscopes of the highest class. Not only are ordinary oculars and ordiuary objectives employed, but the separation between them is that at which they are commonly placed in Swift microscopes designed for purposes of the most minute and elaborate research.

A photographer who possesses an attachment of this kind cannot, of course, hope to obtain photo-micrographs of bacilli and other almost invisible objects, but it is surprising what he can do with very little trouble and at times when ordinary photography is out of the question. Undoubtedly, it is preferable to prepare one's own slides, but for those who have not the time or inclination to do so, plenty of interesting objects are available at a low cost, and often a single slide of, for instance, a complete insect will yield material for half-a-dozen good photo-micrographs. Very few accessories, too, are wanted. A bullseye condenser is useful, though not essential, and artificial light is better than daylight, because it is more stable. In photo-micrography there is no satisfactory rule by which exposures can be calculated, and test exposures are even more necessary than in enlarging. After a little practice tests with electric light, acetylene, or incandescent gas can be made very easily, which will suffice to indicate pretty accurately most of the exposures required to be made for a batch of similar subjects, even though the latter have to be photographed at different powers. As regards manipulation, work with an attachment such as that under allusion is an extremely simple matter. The instrument is screwed into the camera front just as if it were an ordinary lens, a specimen slide is placed in position on the stage with the illuminant behind it, and focussing is effected by means of the sliding jacket or outer tube of the attachment. By holding the circular stage between the middle finger and thumb the object can be sharply focussed, even when a ½-inch in place of the standard 1-inch objective is used. To the back of the stage a fitting can be fixed, enabling a sub-stage condenser or iris diaphragm, or both, to be used, if desired. Without these additions, however, a great deal of interesting photo-micrography can be done, and for the scientific and technical worker the instrument provides a very simple and efficient means of examining the graininess of different negatives, effects of intensification, etc. It goes without saying that, where only visual observation is needed, the attachment can be used in the hand, but many may welcome the facility afforded of obtaining graphic and accurate records of the relative "fineness" or "coarseness" of various brands of plates for purposes of comparison.

Photo-micrography, like telephotography, may never become widely popular, but, like its antithesis, it has many claims to attention, and it has the advantage that no special conditions of weather or atmosphere are needed to produce good results. Simplification of the means employed is a step in the right direction, and, now that a firm of unquestioned repute has placed on the market a comprehensive instrument which any intelligent possessor of a rigid camera with a moderately-long extension can use with success, many may be induced to take up this branch who formerly regarded it as either outside their inclination or beyond their reach.

WATCHING SOLUTIONS AT WORK.

In view of the popularity which the so-called "stand" method of development is winning for itself, a peculiar interest attaches to the communication by E. R. Bullock, of the Eastman Kodak Research Laboratory, which appears in our present issue. Mysterious markings and variations in density have probably come within the experience of most professional photographers, especially those who cater for the development and printing requirements of the amateur. Any work which leads to a smaller proportion of unsatisfactory negatives being obtained, particularly when it is felt that the undesirable features have been introduced whilst the plates or films were in the hands of the professional, will prove to have a value which can be computed in pounds, shillings and pence, quite apart from its intrinsic value as a research leading to the acquisition of new knowledge. Mr. Bullock, like many other observant operators, noticed peculiarities and irregularities in the action of certain bleaching baths, and, being so fortunate as to have facilities at his disposal for probing the matter, he satisfied himself that as is usually the case, the sensitive material was not to blame. He was also able to satisfy himself that agitation of the bath prevented irregularities of the action. "Why go further?" the practical photographer might be tempted to ask. "Why not print the instructions to agitate the bath, or to reverse the developing tank, in block type on the instruction sheet, and leave it at that?" The answer which the researcher would undoubtedly give would be "Because one should know how and why." The discovery of the how and why is usually a tedious business, and, if the manner in which the results of a research are presented is oftentimes the reverse of inspiring, it should be remembered that not only is research itself a very "slow" game, but our judgment should be tempered by the consideration that the training which makes a researcher leaves very little time for him to cultivate a novelist's literary style.

When we look more closely into the matter we see, however, that in its essentials even the driest account of a research is fascinatingly interesting because of its simple and logical steps. In the present research, what was more natural, for example, than to assume that if a strip of film hanging in a "still" bleaching bath is bleached less rapidly at the lower end than at the top, the decrease of the action may be due to exhausted solution from the top of the film streaming down the surface and, as it descends, rushing the fresh solution out of the way? This would lead to the conclusion that the exhausted solution is specifically heavier than the fresh, and again it would be natural to try the effect of using a solution which would yield specifically lighter products when it acted, in the hope that a reversal of the direction of increased action would be shown. These things were tried by Mr. Bullock, and Figs. 1 and 2 afford striking proofs in black and white of the accuracy of the reasoning. The photographer need not worry himself over such matters as "catalysis of the reaction," which are mentioned in the report, for even the most erudite amongst the chemists and physicists of the day do not pretend to understand "catalysis." All that need be remembered is that if for any reason the heavier or lighter modified solution has *not* lost its attacking power, a falling off in the attack of the ascending or descending stream will not be noticed—a statement which is self-evident, and the truth of which was confirmed by tests with an acid solution of persulphate.

One striking feature of the research is that of the bleaching of two strips of film, one above the other, each strip, it is stated, showing the stream variation effect, independently of its position. One would naturally have expected that the exhausted stream from one strip of film would have affected the rate of bleaching on the next strip. From the context it appears as though the mere cutting of the film causes a sudden break in the continuity of the ascending or descending stream. Assuming, as one should, the correctness of the observations, we would suggest that the break in the effect is due to the slight curl of a hanging strip of cine film suspended in a solution which causes the gelatine of the emulsion to swell. This curl would deflect the exhausted stream possibly to such an extent that it would pass along the reverse side of the film immediately above or below. It is not clear whether this "break" was noticed in the case of gelatine emulsion on glass plates situated one above the other in the bath—it is only referred to in connection with films—and perhaps at a later date Mr. Bullock will find an opportunity to clear this point up.

The desire to see with the physical eye as well as with the mind's eye, is just as strong in the case of scientists as it is in that of the man in the street who readily enough subscribes to the picture newspaper and visits the cinema. This desire has in the present instance led to the discovery of an exceedingly simple and neat way of demonstrating, during its actual existence, the presence of the "stream" and has, moreover, enabled measurements of solubilities of certain compounds to be made with a reasonable degree of accuracy. After experimenting with such substances as lamp black, sulphur, etc., it was noticed that cotton fibres, when present in the solutions being investigated, were sufficiently visible and specifically light enough in weight as to afford an indication of the "stream" or convection current, with the added advantage that the rate of travel of the "stream" also became discernible. Other things being equal, it is obvious that the rate of the "stream" will afford an indication of the rate of the reaction which is occurring between the solution and the image on the plate or film. The elegant way in which these observations were utilised to investigate the solubility of silver selenocyanide is detailed in the paper.

When we turn to that portion of the communication dealing with the existence of convection currents in "still" developing and fixing tanks, we are on ground over which most present-day photographers will find little difficulty in following the investigator. The experiments with the fixing baths are particularly interesting in that they support the view that the solubilisation of the sensitive silver salts does not take place in such a way as to form first an insoluble double compound. This opinion has already been expressed by MM. Lumière and Seyewetz, and leads to important conclusions with regard to the cause of fading by sulphurisation of bromide prints. Altogether, the communication is worth careful perusal by the worker who wishes to understand the inner mechanism of his everyday operations.

SOME FACTORS CONCERNING THE RAPIDITY OF A LENS.

(*Concluded from page* 95.)

The pinhole and bromide paper method is familiar to most, and is useful for ascertaining the value of the full opening, but is not convenient for determining a smaller standard stop where the full opening is not in the series. A piece of ground glass pressed against the lens hood can be substituted for the bromide paper.

Mr. Welborne Piper suggested a simple plan of direct sighting along a scaled block of wood laid on the lens hood,

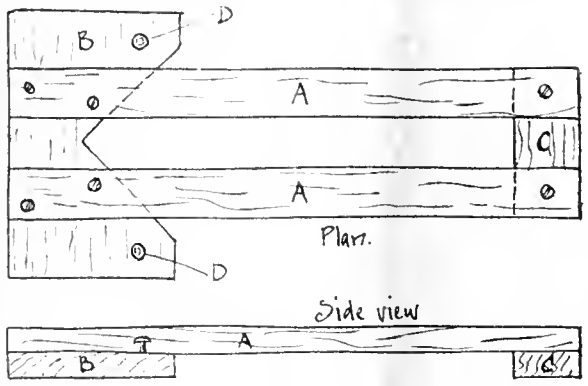


Fig. 1.

but some who have tried it have not found it quite satisfactory, it not being easy to sight along a line drawn on a flat surface. It is, however, only fair to add that our old member suggested additions for more accurate reading.

One of us (Mr. Jobling) has devised a modification which is easily sighted, and reads with great accuracy, as it is

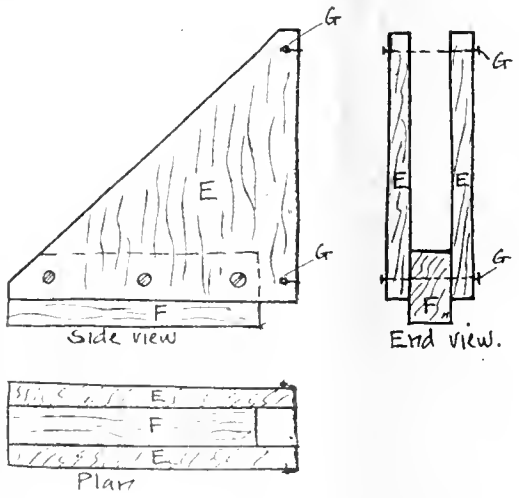


Fig. 2.

self-centreing. Its construction will present no difficulty to any woodworker of moderate skill.

The component parts are illustrated by sketches in figs. 1, 2, and 3, the complete apparatus in position on a lens hood being shown in fig. 4.

Fig. 1 is made up of two strips A, about 7 in. × ¾ in. × ¼ in., which are both secured to a piece B, about 4 in. × 3 in. × ¼ in., and made rigid by a short connecting piece C at the other end.

The complete guide rests on the lens hood, which fits into the V-grooves in B, an elastic band passing round the hood and hooking on to the pins D. The guide rails A are thus centred upon the hood. The sight carriage, fig. 2, slides upon the rails A, the guide F fitting between them.

Two side pieces E, about 3½ in. × 3½ in. × ¼ in., are secured to a spacing piece F, which is about 3 in. × 1 in. × ¼ in. Four pins, G, in the sides, E, serve to hold cross "wires" of fine silk thread.

The remaining part of the apparatus (fig. 3) is a cursor of bent tin or other metal, the width, W, being about 1¼ in. The space between the flanges is such as will give a sliding fit over the rails A.

The apparatus is used in the following way:—Assuming the rails to be in position as just described, slide the sighting slide along until the right-hand edge or side of the lens stop is in alignment with the two cross wires. Then bring the cursor up to the vertical faces of the slide, thus recording its position. Next move the slide to the left until the cross wires are in alignment with the other edge of the lens stop, and measure the distance between the cursor and the vertical faces of the slide. This can be done with an ordinary graduated rule. To facilitate the sighting it is advisable to support the lens upon a sheet of glass with a

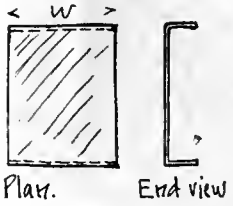


Fig. 3.

sheet of white paper at some little distance beneath, as shown in the illustration. With an apparatus of the sizes given, the effective aperture of small quarter-plate lenses and under, up to large portrait lenses with hoods of 4 in. diameter, can be measured with ease.

For some eyes the distance between the cross-wires may be found too great; in such a case it can be reduced. Viewing them at a fair distance will also be found of assistance. The simpler apparatus devised by Mr. Piper obviously can be combined with the method of centreing described.

There are many methods of ascertaining the focal length of a lens, a simple way only requiring a foot rule and a camera, and doubtless sufficiently accurate for all practical purposes, being described by Mr. A. Lockett in the "B.J." of 1915, p. 411.

So far the factors concerning aperture only have been touched upon in relation to rapidity, but there are several others which it is now generally recognised have an appreciable bearing.

Losses due to absorption and reflection occur in unequal degree; and if the illumination as a whole on the plate is considered, the cutting off of light at its edges by the lens mount varies widely in different types of lenses, and with the focus of the lens in relation to the plate. The latter factor also introduces a variable into the lessened intensity at the margin, due to the plate seeing the diaphragm opening at an angle, or side-ways.

Even the corrections of a lens may play a part, especially

in the rendering of shadow detail. Frequently it happens that shadow detail portrayed sharply may be so faint as only to be barely printable. In such a case a soft-focus (aberrated) lens by spreading the image will reduce the deposit on the negative to the vanishing point, and a void in the print results. Complaints have been made as to the occasional loss of texture in the shadows when using such lenses, and possibly this is the reason.

The losses due to reflection and absorption have been carefully investigated in the past by Mr. H. H. Cheshire and Dr. Zschokke, but the results obtained, broadly speaking, apply only to orthochromatic plates exposed behind a filter, the ultra-violet, violet, and part of the blue being excluded. Although the conclusions arrived at are very valuable and interesting, yet from a practical point of view rapidity in a lens appears to be most essential when the shortest exposures are compulsory, and extreme-speed "ordinary" plates are of necessity employed. Here the transparency of the lens to the actinic rays becomes of prime importance.

Mr. Cheshire estimates for each glass to air surface a loss of nearly 5½ per cent. of the light falling upon it. A land-

Fig 4

scape lens presents two glass to air surfaces; a doublet four, and a triplet six. Assuming a thickness of 5 mms. for each component lens, in round figures the first transmits 89 per cent. of the incident ("orthochromatic") light, and the second and third respectively 79 and 69 per cent. Four and five separated lens systems, respectively 60 and 52 per cent.

These figures speak for themselves, and are sufficiently remarkable; but more striking differences may arise in practice, when an appreciable amount of ultra-violet may be passed by a thin lens, and be almost entirely absorbed by a thicker lens composed of the same, or other glasses.

Many a time has been expressed astonishment at the rapidity of the tiny landscape lenses fitted to vest-pocket cameras, which seems out of all proportion to their relative value of about f/12, and the single shutter speed rarely, if ever, slower than 1/30th second. Also the Cooke f/6.5 triplet has often been referred to here as a relatively fast lens, which probably the thinness and transparency of its glasses account for, the f 6 Aldis sharing this commendation. Doubtless not a few other English lenses are now of equal rapidity, aperture for aperture, but they are many, and comparisons are not so often made as when only a few anastigmats were on the market.

As a contrast to thin lens-systems the Goerz "Dagor" lens may be mentioned with apologies, if any are needed. Despite the combined thickness of the six glasses used in its two triple-cemented elements, it had a great reputation for rapidity, which its aperture of f 6.8 (not always realised) most certainly did not account for. On the other hand, many have been known to express a firm belief in the comparative *slowness* of certain anastigmats apart from aperture.

Unfortunately, the ordinary worker has no way of testing the matter except by general deductions based on actual practice, and no exact values can be assigned. To meet this need it has been suggested that lens makers should indicate the *efficient* aperture in some way.

Mr. Brown, in the articles alluded to, suggests they might supply a co-efficient increasing the F. No. to a greater or lesser extent in comparison with an ideal lens (of perfect correction, and absorbing and reflecting no light) or by comparing one lens with another, but he does not appear very hopeful that any such plan will ever be adopted.

The second suggestion does not seem so practicable as the first, but in any case two co-efficients, at least, would be necessary, one for application when "ordinary" plates were in use, and one when screened orthochromatic plates were employed, as it might well be that one lens, fast for an ordinary plate, might be slow for an orthochromatic one, and *vice versa*. Also, matters would be rendered very complex if other than central rays were considered, and thus would be left, as it is now, any definite information relative to the intensity of illumination beyond a relatively small angle.

With extra-large aperture lenses a rapid falling off of light from the centre to the margins of the plate usually occurs, due to the greater separation of thin components; whilst with many types of anastigmats the components are brought so close together as to afford the maximum uniformity of light over the plate, and they are proportionally the faster. True, a narrow-angle lens, or one with a circle of illumination of diameter not greatly exceeding the diagonal of the plate it is designed to cover, other things being equal, reduces fog due to reflection from the bellows or walls of the camera, and has often been praised for this reason. But as this is necessarily accompanied by an appreciably lessened intensity at the margins of the plate, a lens capable of covering a much larger one than that in use, and fitted with an efficient lens-hood to trap superfluous light, is in most cases to be preferred.

Portrait lenses, perhaps, are the worst offenders as regards non-equality of illumination, a feature, however, which may be helpful in portraiture by subordinating the margins of the picture. The late Mr. J. H. Dallmeyer, F.R.A.S., many years ago gave some instructive figures in reference to the famous f 3 portrait lens. He pointed out that it equally illuminates a central spot of 12 deg. only; at 32 deg. this illumination is reduced to one-half, and beyond this it diminished again until at 52 deg. it ceases altogether. These angular values expressed in inches of circular area for a 3½-in. lens of 12-in. equivalent focal length are (in round numbers) 2 in., 6½ in. and 13 in.

Quite apart from any question of definition, it will thus be apparent that a careless use of the rising or falling front in relation to the more important parts of the subject on the plate, may reduce the full rapidity of a portrait lens there very materially, whilst its judicious employment will retain it more or less.

VIVIAN JONLING.
E. A. SALT.

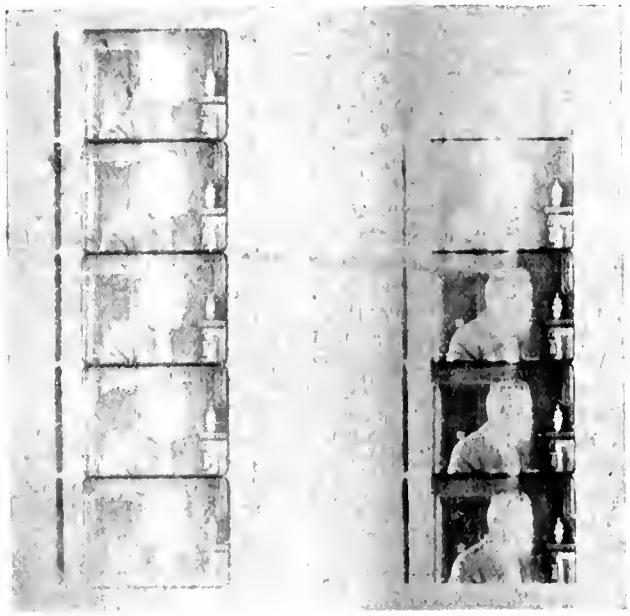
ON CONVECTION EFFECTS IN PHOTOGRAPHIC BATHING OPERATIONS IN THE ABSENCE OF AGITATION.

A Communication from the Research Laboratory of the Eastman Kodak Company.

WHEN a silver image in gelatine on a strip of glass or film support is immersed vertically and then left at rest in a solution of potassium ferricyanide and potassium iodide in a glass tube, it can be seen while watching the course of the bleaching action that the rate of bleaching is greater at the lower than at the upper end of the strip. This phenomenon has now been submitted to an investigation, which, although somewhat hurried and in some respects incomplete, has led to results and conclusions of sufficient apparent definiteness and general interest to justify their publication. As far as the writer is aware, the subject in its general bearing on photographic bathing operations has not been discussed in the literature hitherto, although certain of the facts involved, such as the appearances which arise in stand development, when agitation of the developer or reversal of the tank is omitted, have been described.

The above-mentioned effect has been noticed previously in the Laboratory and attracted the writer's attention recently when bleaching some short lengths of printed cinematograph film in a solution

I. II.



Showing partial action of :—I, Ferricyanide-iodide; II, Chromic Acid Solution.

of potassium ferricyanide 1 per cent., and potassium iodide 0.3 per cent. The first suggestion of a lack of uniformity in the picture was quickly shown to be unfounded; and the effect was obtained equally (1) under various degrees of illumination, (2) when the solution was protected from evaporation, and (3) under the pressure due to a head of 35 ins. of the solution. The effect was also obtained equally with silver images in (1) gelatine on glass, (2) collodion on glass, and (3) gelatine on film support. As the result of density measurements it was found that with glass and film alike the density of a partly bleached (and then fixed) image diminishes continuously from the top to the bottom, the rate of diminution not being uniform, however, but tending to be less in the middle portion than either near the top or near the bottom. (In the illustration, I is a short strip of film picture which has been bleached in ferricyanide iodide solution and fixed.) As regards the magnitude of the effect, it may be mentioned that density measurements of one particular plate, 16 cm. in length, that had been uniformly "flashed," developed, cut lengthwise into two, and one-half then partly bleached by vertical immersion in ferricyanide-iodide and fixed in hypo, showed that the density had been reduced to about 25 per cent. of its original value at a level 1 cm. from the top, and to about 10 per cent at 1 cm. from the bottom.

The magnitude of the effect is influenced, although not very greatly, by the length of the immersed image, being somewhat greater the longer the image. If two or more strips of film are arranged in a long tube, either one strip immediately above another, or with intervals between each strip, and bleached simultaneously, each strip shows the effect independently of its position, and in a degree varying only with its length. A moderate degree of vibration has no appreciable influence on the effect; this was shown by comparative tests in two buildings, in one of which the vibration (due to proximity of machinery) is much greater than in the other. Shaking the tube by hand, or stirring the solution, during the reaction, however, entirely prevents the appearance of the effect.

Passing now to the effect of other halidising (halogenising) bleaches, it was found to be generally true that a bleach (such as ferricyanide-iodide or iodine-in-potassium-iodide solution) which converts silver to silver iodide shows the effect more strongly than one which converts silver to silver bromide. Of the latter, ferricyanide-bromide, permanganate-bromide, chromic acid and bromide, and bromine water were tried; the effect being always found, although less strongly marked. With chloridising (chlorinating) bleaches (such as permanganate-chloride or chromic acid and chloride), the effect was also always found, but in a further diminished degree. The invariability with which these results were obtained, and the regular gradation in the magnitude of the effect when passing from iodide through bromide to chloride, with a variety of images in gelatine on glass or film support, suggested that a consideration of the physical chemistry of the reactions would reveal some simple explanation of the main effect.

It was obvious, on consideration, that the chemical process which (and which alone) is common to all of the above-mentioned bleaching reactions is the union of silver with halogen, that is, with iodine, bromine, or chlorine. The halogen is *lost* by the solution, and *gained* by the image held in the gelatine film, entailing changes (in accordance with known physico-chemical data) of volume and density of both solution and image. Of these changes there is one, namely, the *density*-change of the *solution*, which will give rise to motion in the form of a gravitational convection current. Density being diminished, an upward current will be established along the surface of the film, and will continue throughout the course of the chemical reaction. Provided that the reaction products do not catalyse the reaction, the current must have the effect of accelerating the reaction at the point where it begins (that is, at the bottom of the film), and of accelerating it in a smaller and smaller degree, or of actually retarding it when it has suffered a loss of halogen during its upward progress along the surface of the gelatine film. This is exactly the effect observed; and the explanation was, therefore, regarded as a satisfactory one at this point, and was used as a working basis for arranging new experiments. In the case of a reaction in which the density of the solution *increases*, a *downward* current should be produced, and, provided that the reaction products do not catalyse the reaction, the latter should be accelerated at the top of the film and relatively retarded at the bottom. Again, an increase in the viscosity of the solution should, in general, entail a change in the magnitude of the effect.

It had been found that the magnitude of the effect did not vary very appreciably with the time required just to bleach an image completely at its lower end, provided that this time was of the order of five minutes, and the concentration of the various halidising bleaches used in the comparative tests had been adjusted accordingly. A solution containing chromic anhydride 0.05 per cent. and sulphuric acid 0.2 per cent., was now found to attack the image at about this rate, giving, in accordance with the theory tentatively proposed, a reversed effect, namely, an accelerated reaction at the top of the film, and a relatively retarded one at the bottom. (In the illustration, II shows the partial action of this bath.) It should be stated that not quite the whole of the silver

that is attacked is carried into solution by the action of this bath, a small portion remaining in the image as silver chromate, removable by fixing in hypo. A striking comparison is, nevertheless, shown by using this bath respectively without, and with the addition of potassium bromide to the extent of about 0.5 per cent.; the action being greatest in the former case at the top and in the latter at the bottom. Permanganate-sulphuric acid solution was tried and found to act like the chromic acid-sulphuric acid solution, both as to the direction and the degree of the effect. Persulphate-sulphuric acid gave a comparatively feeble effect in the same direction. In this case,[1] in view of the auto-catalytic character of the reaction,[2] the observed diminution is intelligible, as also, indeed, would have been a reversal of the effect. Silver-dissolving solutions other than these were not tried, as it appeared that the result predicted from the proposed theory had been found without a doubt.

According to the theory, also, an increase in the viscosity of the solution should be accompanied, in general, by a change in the magnitude of the effect. Inasmuch as diffusion as well as convection is impeded by an increase in viscosity and as an impedance of diffusion may increase the effect while an impedance of convection will certainly diminish it, it was not possible to predict the result which would be found. As a means of increasing the viscosity of the solutions without affecting the nature of the chemical process, pure sodium sulphate was added in varying amounts up to saturation to ferricyanide-iodide and chromic acid-sulphuric acid solutions, respectively. After increasing the concentration of the active constituents, to compensate for the general slowing of the reactions, a distinct diminution in the magnitude of the effect was observed when much sodium sulphate was present in the former case, while in the latter there was little or no difference.

Attempts were now made to demonstrate the actual presence of convection currents during the chemical reactions of the two types considered. The first thought was that of adding to the solution some kind of particles sufficiently large to be individually visible, and yet sufficiently small or of sufficiently low density to remain in suspension for at least about five minutes. Lamp-black, sulphur and silver halides were tried, and occasionally a drift of the particles in the direction indicated by the theory was observed, but these substances as used were obviously unsatisfactory for the purpose. Short fibres accidentally present in the solution having been seen to move either up or down the vertically-immersed film, when by chance they had come into its immediate neighbourhood, this suggested the deliberate use of cotton fibres. A small piece of cotton-wool was pulled out by hand and the fibres cut transversely into short lengths by means of scissors. When added to the solution, these short pieces of cotton fibre settled only slowly, were readily visible when brightly illuminated, and showed the position, direction, and duration of the current by their movement. While it is doubtless possible to find other more suitable methods, yet the use of short lengths of cotton fibre in the solution seems reasonably satisfactory for the demonstration of the actual existence of the theoretically-indicated currents. The phenomenon is more striking in the case of an upward than in that of a downward current, for in the former case the particles are borne away from the region into which they are slowly settling by gravitation, travel up the surface of the film and into the solution above it, and then turn in a fountain-like curve and descend at a greater distance from the film.

A method of general application for the demonstration of the occurrence of chemical reactions between images in gelatine films and solutions in which the films are immersed appears, therefore, to be available. It will fail only in the special case of the density of the solution being unaltered by the reaction. The method may prove useful in the investigation of photographic and general chemical problems. One example of its application will be mentioned. Potassium selenocyanide (KCNSe) had been observed at one time by the writer to behave as a somewhat powerful restrainer when added to a developer, and it was surmised that the solubility of the corresponding silver salt was quite small. In order to determine where the solubility lies in comparison with the solubilities of the silver halides, the following experiment was made. Images on cinematograph film were bleached to silver chloride, bromide, and iodide respectively, then immersed vertically in an 0.5 per cent. potassium selenocyanide solution, to which cotton fibres had been added. In the case of the chloride image, an upward current, lasting for about 3.5 minutes, was observed; with the bromide image a relatively very feeble current lasting for at least 5.5 minutes, and with the iodide image no current was seen. Images of silver selenocyanide, as obtained by somewhat prolonged immersion of the chloride images in the selenocyanide solution, followed by washing, were then immersed in an 0.5 per cent. potassium bromide solution: no movement of the cotton fibres could be observed. It is thus apparent that while a reaction is shown between silver bromide and dilute potassium selenocyanide solution, no reaction is shown either in the case of silver iodide or between silver selenocyanide and dilute potassium bromide solution; and the inference is permissible that the solubility (in water) of silver selenocyanide falls between the solubilities of silver bromide and silver iodide.

Passing now to the subject of *stand development*, it is of practical importance to minimise spontaneous convection, and the consequent variation of action at different levels of the immersed emulsion film.[3] (In the case of bleaching reactions the practical question scarcely arises, inasmuch as the reaction is—almost invariably—allowed to proceed to completion; and in the case of the silver-dissolving reactions, these are either carried to completion as in the Autochrome reversal, or under control in a tray as in the persulphate reduction of negatives.) From a consideration of the chemistry of development—broadly speaking, a gain of halogen by the solution—it may be predicted that convection effects do, in general, occur whenever agitation is omitted, not only when the emulsion film is vertical, but also when inclined or horizontal. With vertical immersion, as in ordinary stand development, the current should be downward, causing stronger action at the top than at the bottom of the film, and the effect should be strongest in the development of silver iodide and weakest in that of silver chloride. In order to test the correctness of these conclusions, the following experiments were carried out. Strips from a roll of positive cinematograph film containing a series of uniformly exposed and developed images from one and the same negative image were bleached respectively to chloride by means of a freshly-prepared solution of potassium permanganate, sulphuric acid, and sodium chloride, followed by a clearing solution of sodium bisulphite, to bromide by means of a ferricyanide-bromide, and to iodide by means of a ferricyanide-iodide solution. The bleached strips were in all cases washed for about 20 minutes and then dried, the washing, drying, and subsequent development being carried out in subdued daylight, taking great care that the light-exposure received by each strip should be fairly uniform throughout its length. Three different developers—amidol, MQ, and pyro-soda—were now taken and so diluted that a satisfactory degree of development was effected in about five minutes in the cases of the chloride and bromide images; for the iodide images the developers were used undiluted. Treatment of each of the three kinds of images with each of the three images showed clearly, in seven out of nine cases, a somewhat greater degree of development at the top than at the bottom of the strips; in the other two cases, however, the reverse effect was found. These cases were those of the action of dilute pyro-soda developer on the chloride and bromide images, and the reason for the anomaly was quickly surmised—oxidation is rapid with this developer and the effect of preferential oxidation of the upper portion may preponderate over the convection effect. On diluting the stock developer with 2 per cent. sodium sulphite (Na_2SO_3) solution instead of with water, the anomaly disappeared. It may, therefore, be concluded that during normal stand development a downward current prevails, entailing a greater degree of development in the upper than in the lower portion of the emulsion film. In the case of the iodide films the existence of the current was verified by the cotton fibre method already described; in the other cases, on account of possible complications through uneven illumination, observations were not attempted. It was also not attempted, on account of the time which might be consumed for the satisfactory establishment of the facts, and the comparative unimportance of the result, to compare qualitatively the magnitude of the effect with the respective silver halides. In order to obtain a roughly quantitative estimate of the magnitude of the density differences likely to arise in ordinary stand development without agitation, ordinary bromo-iodide films and plates were given

1. Stratochemical effects are described by Sheppard in a paper to be published on the "Persulphate Reduction Anomaly."

2. H. Marshall, "Action of Silver salts on Ammonium Persulphate Solution," *Trans. Roy. Soc. Edinburgh*, Vol. 33, 163.

3. The influence of stirring on the rate of fixation was investigated by Sheppard and Mees (Investigations, pp. 126-129). Irregularity of fixation-rate was traced to convection currents, and the existence of these has been observed by Sheppard and Davis (in a paper to be published).

a uniform exposure corresponding to a point somewhere in the over-exposure region of the characteristic curve, and then vertically immersed in developers of such dilution that a density of about 2 was obtained in five minutes at 20 deg. C.; for the films an MQ developer diluted with water was used, and for the plates a pyro-soda developer diluted with sodium sulphite solution. The strips taken were about 16 cm. long and about 3.5 cm. wide; and subsequent density measurements showed that the density difference at points 1 cm. from the top and 1 cm. from the bottom amounted in all cases to between 5 per cent. and 10 per cent. A general effect of this magnitude on an image might, perhaps, be disregarded for most purposes, but the local effects in consequence of the juxta-position of high-lights and shadows may occasionally be serious. With horizontal development at rest and the emulsion film up, the reaction products of development will tend to accumulate unduly in the emulsion film and in the lowest layers of the solution; while with the emulsion film *down* over a moderate depth of developer, the reaction products will tend to be removed as soon as formed, and development will be relatively accelerated. In actual comparative trials, using Seed Graflex plates, an image density greater by about 20 per cent. or 25 per cent. with no greater fog was found in the latter case, but development is never uniform, and the method is, therefore, not applicable in practice.

Finally, a few observations were made on the process of fixing. A number of different bromo-iodide emulsion plates were taken, cut into strips, and immersed vertically in hypo solution of such concentration that in each case the plate was visibly cleared in about eight minutes. Cotton fibre having been added, the initial phenomenon observed was a strong downward current, which continued until the greater part of the opacity of the emulsion was removed. At this point it was very apparent that the *upper* portion of the strip was the more transparent. The current now became feebler, and the rate of clearing of the plate much slower than before. At the point of complete clearing a difference of behaviour was noted depending on the brand of plate: in some cases the current appeared to cease somewhat abruptly as soon as the plate was cleared, while in others a feeble downward current could be observed to persist for up to two minutes longer. It seems very probable that the rapid removal of the greater part of the opacity and the simultaneous strong (downward) convection current represent broadly the dissolution of the silver bromide, while the relatively slow removal of the residual opacity accompanied by a relatively feeble current represents similarly the dissolution of the silver iodide. The results tend, moreover, to cast a doubt on the supposition that the sparingly soluble sodium silver thiosulphate ($NaAgS_2O_3$) is formed during the fixing of a bromo-iodide plate or film; and in regard to the theory of this reaction it may be mentioned that it is probable that by mistaken analogy a misapprehension has crept into the photographic[4] literature. For the sparingly soluble thiosulphate having the composition $NaAgS_2O_3$, which was obtained by Lenz in 1841 and by Rosenheim and Steinhäuser in 1900, was obtained respectively by a reaction between hypo and silver nitrate, and one between hypo and freshly precipitated silver chloride; and, on solubility considerations, it does not necessarily follow that this particular double thiosulphate is obtainable also from hypo and silver bromide or iodide in the condition in which these salts exist in the photographic emulsion film. Experiments by Mr. J. G. Capstaff of this laboratory, in 1917, showed, indeed, that in the case of bromo-iodide plates an immersion in the fixing bath only up to the point of complete clearing, followed by a washing of ordinary duration, was sufficient for the practically complete removal of the silver halides, as shown by the absence of a discoloration on treatment with sodium sulphide solution.

Summary and Conclusions.

1. The relatively more rapid bleaching of a silver image on cinematograph film at the lower end of a strip immersed vertically in a ferricyanide-iodide solution was found to be a special case of a general phenomenon, which is seen with all silver images on an impervious support when immersed vertically in any halidising (halogenising) bleach.

2. By theoretical reasoning it was concluded that the above-mentioned phenomenon must be attributed to the effect of the existence of an upward convection current having its origin in the diminution of density of the bleach solution in contact with the image by the chemical reaction which takes place.

3. Silver-dissolving solutions were found to act more rapidly at the upper than at the lower end of a vertically immersed silver image. The actual existence of upward convection currents during the action of halidising bleaches, and of downward currents with silver-dissolving solutions, was demonstrated by the motions of suspended short lengths of cotton fibre.

4. A general method is thus available for the demonstration of the occurrence of a chemical reaction between a solid and a liquid. As an example, it was found that silver bromide reacts with a dilute potassium selenocyanide solution, and from this fact (with others) it was concluded that silver selenocyanide is less soluble than silver bromide, but more soluble than silver iodide.

5. In ordinary stand development (with vertical immersion and without agitation) a downward current prevails, and the degree of development is accordingly somewhat greater near the top than near the bottom of a negative; under usual conditions the density difference due to this cause is of the order of 5 per cent. or 10 per cent.

6. Convection effects during the fixing of a bromo-iodide emulsion seem to harmonise with the view that, broadly speaking, the silver bromide dissolves before the silver iodide. It is probable that immediately after the disappearance of the last traces of opacity during the fixing of a bromo-iodide emulsion the whole of the silver had been converted into the very soluble double thiosulphate.

E. R. Bullock.

4. See, for example, Abney's "Instruction in Photography," 1905 edition, p. 41.

Photo-Mechanical Notes.

Bromide-Chloride Wet-Collodion.

Some time ago at the Royal Photographic Society Mr. W. T. Wilkinson read a Paper describing the advantages of a variation of the wet-collodion process, in which the iodide in the collodion is replaced by a mixture of bromide and chloride. We print below the chief part of this communication, and are able to supplement it by some further practical notes on the process which Mr. Wilkinson has written.

The wet-collodion process requires great skill and care to keep it going, but sooner or later silver iodide will give trouble. In making up a new silver bath it must be saturated with silver iodide. Saturation is only another word for instability; a slight change in temperature will upset the equilibrium, and pinholes and other troubles ensue.

Again, iodine in contact with ether forms organic compounds, possibly aldehyde, and acetic acid, reducing silver nitrate to a metallic state, the silver bath to a state of chaos, and the operator to profanity, and so far as I am personally concerned the method of Scott Archer and Hardwich is dead.

Now, instead of collodion, in which the principal ingredient is an iodide, a bromide is substituted; I say the principal ingredient because neither an iodide, nor a bromide, used alone will give a negative free from fog, and I wanted to entirely banish the use of silver iodide; I mix with the bromide a chloride. This formula has done good work.

Dissolve

Ammonium bromide	240 grs.
Calcium chloride	90 grs.
Industrial spirit	8 ozs.

When dissolved, filter, then add

Methylated ether, .725	12 ozs.

and add this to 60 ozs. of Johnson's or Penrose's plain collodion, and allow at least a fortnight to ripen.

Sensitise in 60 grs. of silver nitrate to each ounce of water. Silver bromide or chloride not being soluble in a solution of silver nitrate, no saturation is required.

Plates coated with this collodion and sensitised in the plain silver bath may be manipulated exactly as one of the old wet-collodion plates would be, *i.e.*, after exposure in the camera develop the image with an iron developer, and finish it off in the good old way; or wash out all the free silver nitrate, expose whilst still wet, then develop with hydroquinone or any other alkaline developer.

This method is extremely useful when long exposures are required such as making 250 step-and-repeat exposures upon a plate

36 ins. by 24 ins., avoiding any corroding of the edges of film caused by the presence of free silver nitrate.

Again, with this collodion, if the washed plates are coated with an organifier, such as any of the old well-known preservatives, gum gallic, gin, whisky, coffee or beer (although I have grave doubts about post-war stuff), and then dried, these plates can be made colour sensitive by using the dyes sent out by the Ilford Co.

Thus plates may be made capable of physical development, or alkaline development, colour blind or colour sensitive.

All the old bath troubles are banished and collodion is elevated into a certain and thoroughly practical process.

In reply to other questions Mr. Wilkinson said that if a collodion salted with a bromide only were used it was very seldom that a negative could be obtained free from fog. If, on the other hand, the iodide or chloride were mixed with it, an image quite free from fog was obtained. A very good proportion was four parts of bromide to one of chloride in the collodion. Colour sensitising could be done by bathing the plates in exactly the way recommended in the Ilford booklet for the bathing of gelatine plates.

If it was desired to make micro-photographs—that is to say, small photographs made from large—it was advisable to make a 5 per cent. solution of collodion and then pour it into water, wash it well with water, press it between clean cotton or linen and spread it out to dry. It would then give a very fine grain indeed. For these very tiny micro-photographs, however, there was nothing better than the old albumen process. It was slow, although with electric light one could get a good exposure in about 30 seconds. The collodion method was a much quicker process, and the resulting grain was nearly as fine.

The bromised collodion had just a little over double the speed of the ordinary iodised collodion, and it was also quicker as a dry plate. For alkaline development the sensitised plate was drained, soaked in two or more changes of clean water for about five minutes, rocking the dish occasionally, rinsed under the tap and drained. It might then be put into the dark-slide, the exposure being a little less than for an ordinary wet plate. In the dark-room it could then be developed with any of the alkaline developers. If it was desired to dry it before exposure, one flooded it with a preservative, stood it up to dry in the dark-room, and then treated it just as an ordinary dry plate. If a line subject, the development was with hydroquinone, but if a continuous tone subject, development could be with amidol or any other developer, just as in the case of a gelatine dry plate.

The old wet-collodion process is still the sheet anchor of process engravers, and during its reign of seventy years has undergone little alteration from the original formula of Scott Archer and of Professor Hardwich, and this in spite of the heart-breaking vagaries of the silver bath, which have had untold pages of literature devoted to them.

As long ago as the sixties of last century M. Carey Lea and Thomas Sutton tried to rouse enthusiasm for a collodion containing bromide, instead of a mixture of iodide and a bromide, but a collodion containing one salt (be it bromide or iodide) will not work, and photographers got the impression that a silver bromide film was not amenable to development by physical or acid solutions. Then Messrs. Bolton and Sayce introduced their collodion-emulsion process, a process that was successful right from the beginning. Consequently all progress with a method entailing the use of a silver bath was stopped, and when in course of time gelatine dry plates came into being wet collodion, with its many inconveniences was shelved entirely by the photographic world. When its second incarnation took place, with the inception of photo-engraving, the process men had too much to learn in regard to etching, screen negative making, etc., to bother about improving a process which was to them quite satisfactory, the bath troubles being got over by the sensible and business-like procedure of having plenty and to spare of silver bath, so that if one lot struck work another was ready to take its place.

Just before the war I came across one of Mr. Sutton's articles, and made up some collodion with cadmium bromide, another lot with ammonium bromide, and both lots were given a fortnight to ripen, but, try as I would, I could not get a clean negative, even with an 80-grain silver bath, and that very acid.

Calcium chloride was then mixed with the collodion and the first plate developed with an iron developer was quite a success. When the war came I switched off into ordinary portrait photography, and until 1920 was unable to make experiments of any kind. Since then I have given considerable time to studying and experimenting with bromised collodion, and can now safely say that, given an intelligent operator, without prejudice against new fangled ideas, the old wet collodion is quite dead.

Bromo-chlorised collodion procedure has many advantages. First of all the silver bath is just a solution of silver nitrate in water, 70 or 80 grains to the ounce. Just made acid with nitric acid it is at once ready for use, and no matter how the atmospheric temperature varies, the bath works uniformly and well, until at last the time of sensitising gets longer and development lags, occasioned by lack of silver nitrate. Then add with more silver nitrate, and everything is all right once again.

The bromo-chlorised film, after exposure in the camera, may have the image developed, fixed, copper-intensified, cut, and intensified exactly as is the practice in the old wet-collodion process. If the silver bath be kept up to strength the camera exposure is shorter and the density of dots, etc., greater.

When long exposures are needed, as in step-and-repeat machines, it is advisable to wash the sensitive plate in clean water until all free silver nitrate is got rid of. Then drain, and expose (no loss of sensitiveness need be feared), and develop with an alkaline developer. The image flashes out at once, and full density is attained in from 30 to 60 seconds, *wash* and fix in cyanide or hypo, again wash, flood with iodide of potassium and iodine and cut with cyanide, etc., as usual.

The washed sensitive plate may be converted into a dry plate by flooding with gum gallic preservative, drained and dried.

Thus with bromo-chlorised collodion it is possible to develop and finish the negative just in the old wet-collodion way, or wash out the free silver nitrate, expose wet, develop with an alkaline developer (say, hydroquinone for a line subject, pyro-soda for continuous tone), and then finish in the same way, or after washing away the silver nitrate apply a preservative, dry the plate, and you have a dry collodion. By these methods colour-blind plates would result, but by bathing in certain dyes, before applying the preservative, the dry plate can be made colour-sensitive.—W. T. WILKINSON.

The following patents have been applied for:—

APPARATUS.—No. 31,779. Apparatus for production of negatives for photo-mechanical processes. W. T. Wilkinson.

PRINTING PROCESSES.—No. 1,982. Photo-mechanical printing process. A. R. Trist.

PREVENTING BREAKING OF GLASS GRADUATES.—The breakage of glass graduates in the dim light of a dark-room by knocking them over is common enough, especially in places where earthenware sinks are used. I have found (writes a correspondent) that such breakages can be avoided if a fairly thick india-rubber band is placed about the top of the graduate. The softness of the rubber softens the fall of the measure, and I have never had a breakage since fitting a band, though tumbles have been many.

DECADENT PRESS PHOTOGRAPHY.—One of the reasons why Editors of modern picture newspapers are cutting down legitimate Press photographs (writes a correspondent) is because of the ridiculous poses in which many Pressmen picture athletes—notably performers in the football field. The game of football does not give the excellent opportunities for really good picture making that other sports do, but this is no excuse for submitting pictures which nobody can understand. Cricketers at the wicket usually make effective compositions, and are fairly easy to take, but a footballer is often an extremely difficult problem, because of the fast-travelling ball and its importance. A cricketer without a ball in the picture will be shown to be a cricketer because of his bat, leg-guards and—perhaps—stumps, but a footballer in a field without a football appears lost, and, maybe, meaningless to many—it depends upon one's knowledge of the game and the clothing worn. We are, however, to be treated to something new, for one of the evening papers recently started an excellent series of photographs of well-known football players in the field, with ball complete. The figures may be posed for the pictures, but if they are, they appear to be playing and full of action, while the all-important ball appears to be printed in, and in exactly the right place.

Exhibitions.

EDINBURGH PHOTOGRAPHIC SOCIETY EXHIBITION.

The Edinburgh Photographic Society's annual exhibition was opened on Saturday, February 18, by the Hon. Lord Salvesen, in the presence of a large gathering, in the Hall of the Society, 38, Castle Street, Edinburgh.

Lord Salvesen, in performing the opening ceremony of declaring the exhibition open, said that practically the rise and progress of photography were measured by the life-time of many people still alive. The art of photography during the last 60 or 70 years had increased in a most extraordinary way. During the war there was a new branch of photography that became possible, that of photography from the air, but that was not so remarkable as some of the other developments, such as X-ray photography and photography as applied to astronomy and other sciences. Photography was, of course, not an art which represented things exactly as they were. Although in a sense a photographic plate could not lie, still, in the hands of an expert it might produce very remarkable results. One had only to think of portrait photography in that connection; how beautiful a portrait might become with the proper lighting and the proper treatment of the plate after the picture had been taken. Landscape photography was a modern development as compared with portrait photography, especially as regards moving objects in the landscape. He hoped the exhibition would attract many people from the ranks of amateur photographers to join the Society, and take advantage of the facilities which the Society offered.

Photographers from all parts of the country have sent in specimens of their work, while members of the Society and local enthusiasts are also well represented. The standard of photography throughout the exhibition is excellent. The judges on this occasion have been somewhat sparing in their awards. The distinction of an award is, on that account, in view of the general excellence of the exhibition, of more than usual value, and it may be said that, in the main, those that have been singled out for special mention have clearly earned their distinction.

Section I. (Landscapes, Seascapes, and Kindred Subjects).—Medals are awarded to W. H. Reece (London) and W. Gerrett (Leven), the former for his picture "The Admiralty Arch," a picture notable for its fine tone and the natural liquescent appearance obtained by the play of light on the wet pavement, while several beautiful effects of light and shade are the characteristics in Mr. Gerrett's study. "Cramond Brig," a very fine study in nice grey tones by G. K. Ritchie, and a fine animal study of "A Young Lion," by J. C. McKechnie, both receive hon. mention.

Section II. (Portrait and Figure Studies).—The only medal award in this section is gained by R. Perkins (Clevedon) for "The Toiler," which contains a wealth of detail, and is marked by fine individuality. "Jackie," by C. Wormald (London), a child study, in which a soft expressive tone is obtained by contrast with a black background, receives hon. mention: as also do "The Fisherman's Wife," by the Rev. J. V. Haswell (Huddersfield); "Idle Moments," a study of three lads watching several yachts at sea, by H. W. Howe (Harrow); a "Portrait of Miss G. P.," by Miss A. M. Hunter (Edinburgh); and "Sharpening the Saw," by R. Douglas Croall (Edinburgh). Simplicity of subject accompanied by the contrast provided by dark shadows and soft high-lights give the last-named exhibit a particularly pleasing appearance.

Section III. (Lantern Slides).—Victor E. Morris (East Grinstead) received a medal for "Morning Mist in Lakeland," and hon. mention for two other slides, titled "In Winter Time" and "Bishop Readman's Tomb, Ely Cathedral."

FORTHCOMING EXHIBITIONS.

February 11 to 25.—Scottish Photographic Salon. Particulars from the Secretary, James F. Smellie, Braefindon, Allanshaw Street, Hamilton.

February 18 to March 4.—Edinburgh Photographic Society. Particulars from the Hon. Secretary, G. Massie, 10, Hart Street, Edinburgh.

March 1 to 6.—Birmingham Photographic Society. Particulars from the Hon. Secretary, P. Docker, Medical Institute Buildings, Edmund Street, Birmingham.

March 4 to 25.—South London Photographic Society. Particulars from the Hon. Secretary, Harry Abbott, 61, Beauval Road, East Dulwich, London, S.E.22.

March 8 to 9.—Birkenhead Photographic Association. Latest date for entries, February 25. Particulars from the Exhibition Secretaries, Messrs. Longstaff and Trace, 33, Hamilton Square, Birkenhead.

March 14 to 16.—City of London and Cripplegate Photographic Society. Latest date for entries, March 4. Particulars from the Hon. Secretary, J. J. Butler, 7, Gresham Street, London, E.C.2.

March 15 to 26.—Welsh Salon of Photography. Latest date for entries, March 9. Particulars from the Secretary, H. G. Daniel, 154, Penylan Road, Cardiff.

March 16 to 18.—Leytonstone and Wanstead Camera Club. Latest date for entries, February 28. Particulars from the Secretary, Charles Wormald, 1, Colworth Road, Leytonstone, London, E.11.

March 27 to April 8.—Dennistoun Amateur Photographic Association. Latest date for entries, March 14. Particulars from the Exhibition Secretary, Colin Graham, 448, Duke Street, Dennistoun, Glasgow.

March 28 to April 1.—Hackney Photographic Society. Latest date for entries, March 7. Hon. Secretary, Walter Selfe, 24, Pembury Road, Clapton, London, E.5.

April 5 to 8.—Leicester and Leicestershire Photographic Society. Latest date for entries, March 22. Particulars from the Hon. Secretary, W. Bailey, Cank Street, Leicester.

April 5 to 8.—Faversham Institute Photographic Society. Latest date for entries, March 31. Particulars from the Hon. Secretary, W. H. Evernden, 116, West Street, Faversham.

April 21 to May 11.—Hammersmith Hampshire House Photographic Society. Latest date for entries, March 30. Particulars from the Hon. Exhibition Secretary, J. Ainger Hall, 26, Bishop's Mansions, Bishop's Park Road, London, S.W.6.

May 1 to 6.—Photographic Fair. Horticultural Hall, Westminster. Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1.

September 11 to 15.—Professional Photographers' Association, Princes Galleries, Piccadilly, London, W. (Trade and Professional). Hon. Secretary, Richard N. Speaight, 157, New Bond Street, London, W.1. Also foreign invitation loan exhibition of professional portraiture. Hon. Secretary, Marcus Adams, 43, Dover Street, London, W.1.

September 18 to October 28.—Royal Photographic Society. Latest date for entries by carrier, August 25. Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, February 6 to 11:—

Printing Frames.—No. 3476. Photographic printing frames. H. W. Harrington.

Developing Tank.—No. 4,113. Developing tank for film packs. G. P. Orde.

Micro-photography.—No. 3,682. Microscopes and devices for micro-photography. N. D. Chopra and E. H. Craggs.

Paper Films.—No. 3,596. Manufacture of paper films. J. Bautz and V. Kriegerbeck.

Cinematographs.—No. 3,595. Automatic cinematographs. J. Bautz and V. Kriegerbeck.

Cinematography.—No. 3,597. Cinematographic apparatus. J. Bautz and V. Kriegerbeck.

Cinematography.—No. 4,065. Films for cinematograph cameras, etc. A. W. Wyatt.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1s. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

MULTIPLE PRINTING FRAMES.—No. 173,116. (October 18, 1920). The invention is a printing apparatus for making one or any required number of photographic reproductions from one or more negatives in predetermined positions on the sensitive surface of zinc, aluminium or copper plates, stone or glass, to be afterwards printed by lithography, typography collotype or photogravure and for ensuring accurate registration in the reproduction of pictures or designs in two or more colours.

In order to enable the printing plate to be readily brought to any one of a number of predetermined positions on the sensitive surface, adjustable stops are provided for engaging the frames by which the printing plate is moved in the different directions.

A negative 2, fig. 1, previously mounted on a plate of glass of

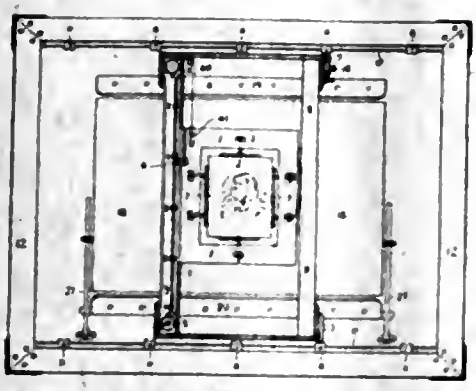


Fig. 1.

Fig. 4.

suitable size and thickness by means of Canada balsam, and having centre marks and cutting or marginal lines marked on its surface, is placed face downwards in the small frame 1 (fig. 1), the marks being adjusted to similar marks on the frame by means of the screws and plates 3. It is then clamped and held in position during the subsequent operations by these screws.

The stops 6 of the rod 7 let in the side of frame 8 are then adjusted to give the required positions for the pictures in the first row of reproductions, and the catch or stop 4 on the side of the frame 1 is drawn firmly against the first stop on the rod 7 by means of the cord 40 and pulleys 5, 5, rigidity of position being maintained by the triangular bearing rail 13, on which the frame 1 slides. The cord 40 working over the pulleys 5 has a small coil spring 41 on the end which joins the frame 1, thus

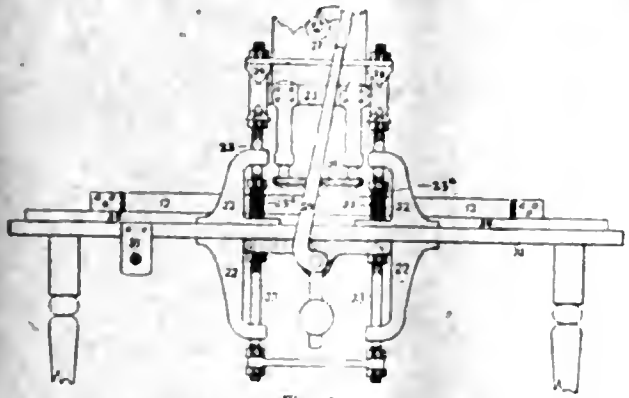


Fig. 2.

keeping the stop 4 on the frame 1 close up to the stop on rod 7, so long as the cord is kept taut.

The pressure plate 26 (figs. 2 and 3), which is a thick glass plate mounted in an iron frame, is then brought immediately over the negative by sliding the carriage 25 and light-box 27 along the triangular rails 24. The lever 29 (figs. 2 and 3) is then brought down to the stop 30, thus bringing the two cams 31 underneath the table, into action against the thick iron plate 32 of the stationary frame of the apparatus. By this means the whole structure of the rails and carriage is forced downwards bringing the pressure plate 26 into contact with the plate glass covering the negative with a pressure which can be modified

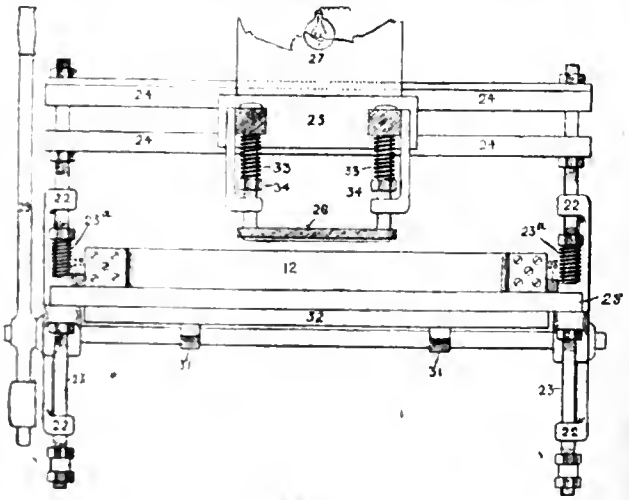


Fig. 3.

and adjusted by means of the springs 33 and nuts 34 on the bars carrying the pressure plate; during this movement the machine is kept rigid and free from all side-play by the bearings 22, so that the action is quite perpendicular and firm.

The pressure having been brought on the negative and contact assured with the sensitive surface 18 (fig. 1) the surrounding surface is shielded by means of curtains 35 (fig. 5), and the light 27, which may be an electric incandescent, or arc lamp or other suitable illuminant, is turned on for the requisite time and the first exposure is made. The light is then shut off, and the pressure released by raising the large lever 29 to the upright position, the carriage and rails and pressure plate being lifted off the negative by the strings 23^a on the guide rods 23.

The negative is brought into position for the next exposure by slightly turning the rod 7 (fig. 1). This brings a slot in the side of the stop 6 (fig. 1) opposite the catch 4 and enables the frame 1 to be drawn up to the next stop by the cord and pulley 5, when the operations of pressure and exposure are repeated.

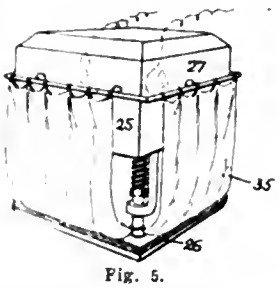


Fig. 5.

These combined operations are repeated until the first row of pictures is complete.

For the second and any subsequent rows, the stops 11 on the divided scales set in the sides of the large frame 12 (fig. 1) having been previously adjusted to the distance dividing the rows of pictures, the bolt 9 is released by unscrewing the milled head 10. This enables the two smaller frames 1 and 8 to be moved together to the next position for the second row, the whole arrangement being held firmly and exact by the V-shaped bolt 9 and the V-shaped slots in the stops 11. The whole arrangement of the three frames and the bed carrying the metal plate slides along the table between the runners 28 to enable each succeeding row of pictures to be brought immediately under the pressure plate 26 and light 27.

The drawings show the method of securing a lithographic machine plate 18 in position (fig. 4). The plate 18 with the usual registration marks (gripper and centre marks) on it, is clamped in position in the fixed clamp 19 and then,

by means of the clamp 20 and the levers 21 is drawn tight across the bed 36 and held firmly during the entire job. For lithographic stone the bed 36 is removed from the frame 37 and the stone simply placed in position, standing firm by its own weight; glass for collotype is clamped to a spare bed of requisite height to accommodate the thickness of the glass.—Albert Disteli, 17, Mount Pleasant Villas, Stroud Green, London, N., and Edward Francis Atkinson, 19, Romilly Road, Finsbury Park, London, N.

The following complete specifications are open to public inspection before acceptance :—

CINEMATOGRAPHY.—No. 174,931. Means for obtaining relief effects in motion pictures. E. Caslant.

Trade Names and Marks.

MARKS PLACED ON THE REGISTER.

The following marks have been placed on the register :—

TINTONA.—No. 416,795. Photographic sensitised paper. The Leto Photo Materials Co. (1905), Ltd., 1, Crutched Friars, London, E.C.3, photographic manufacturers.

KALO.—No. 418,128. Chemical substances used in photography, photographic plates and photographic films. Ilford, Ltd., Britannia Works, Roden Street, Ilford, Essex, manufacturers of photographic plates, paper and films.

New Books.

A FRENCH MANUAL OF BROMOIL.—Under the title, "Le Procédé Bromoil," M. Charles Mendel has just published a booklet by M. G. du Marès dealing with the technique of the Bromoil process, of which, apparently, the author believes M. E. Coustet to be the inventor, M. Coustet having described the process in the "Photo-Gazette" of September, 1907. It would seem that M. Coustet and the late Welborne Piper were simultaneously at work upon the same problem. M. du Marès, who was an immediate worker of the Bromoil method, gives the formulæ for bleachers and a description of the methods of pigmenting which he has come to prefer. The booklet is issued price 1 fr. 20.

AIRBRUSH WORK.—From M. Charles Mendel, 118, Rue d'Assas, Paris, we have received a copy of a little manual of 48 pages (price 1 fr. 20), "La Retouche Photographique par le Pinceau à Air," by M. H. d'Osmond. Basing his text on the "Vaporigraphe" air-brush, the author describes the mechanism and method of using, and sets forth a course of self-instruction in the practice of air-brush working-up and colouring of prints and enlargements. The little manual contains a large number of reproductions illustrating the exercises which the beginner in airbrush work should set himself, following, in this respect, the excellent American manual on the subject by G. F. Stine, which was issued a little over a year ago by the publishers of "Abel's Weekly."

RESTORATION OF PRINTS.—A provisional report has recently been published by the Stationery Office for the Department of Scientific and Industrial Research on the cleaning and restoration of museum exhibits. It represents the results of experiments carried out by Dr. Alexander Scott, F.R.S., at the British Museum in the treatment of prints and engravings which had become spotted or stained with age, and also in the restoration of articles of metal and other materials. Acidified bleaching powder, well known as a remover of stain in paper, is recommended by Dr. Scott for this purpose. Drawings and other coloured pictures which contain white portions consisting of a lead compound may be restored by application of hydrogen peroxide applied by a special process, according to which solution of the peroxide is first absorbed by a block of plaster of Paris. Pyridine is recommended as a means for removing stains and disfigurations caused by oil or varnish. The report, which is quite a short one, is illustrated by a number of supplemental plates consisting of photographic reproductions of originals before and after restoration. It is supplied as Bulletin No. 5 by the Stationery Office, Imperial House, Kingsway, W.C.2, price 2s.

KALLITYPE PROCESSES.—No. 185 of the "Photo-Miniature," which has just been issued, is a monograph on the Kallitype iron-printing process and similar methods by Mr. James Thomson, an American worker, who has made the technique of these processes peculiarly his own, and has published many papers in the periodical press giving the results of his original experiments. Photographers with a taste for preparing their own sensitive material for the making of prints will here find direct and most practical instruction in compounding and coating the Kallitype sensitisers and in the handling of the prints, including a number of methods for modifying the colour obtained by direct development. It is hardly necessary to say that Mr. Thomson is fully versed in the process, and his directions, we are quite sure, can be strictly followed. We notice only one minor slip in the references to Kallitype. On page 218 the use of silver in the developer is described as a variation from the original Kallitype method of Dr. Nicol. In point of fact, Dr. Nicol's paper, when first put upon the market, contained only the iron salts, the developer consisting of silver nitrate in combination with such salts as citrates and borax. This method, however, was very quickly abandoned in favour of the practice of uniting the silver and ferric salt in the coating on the paper. Mr. Thomson also gives ample instructions and formulæ for the working of other iron-printing processes, and publishes a new formula for a sensitiser, compounded of ferric and platinum salts yielding prints of warm brown tone by direct development in a solution composed of citric and oxalic acids and silver nitrate. The monograph, in short, is a valuable compendium of these iron-printing methods, which brings the long experience of the author into exceedingly compact form. Messrs. Houghtons, Ltd., supply the "Photo-Miniature" in this country price 1s. 8d. post free; in the United States the publishers are Messrs. Tennant & Ward, 103, Park Avenue, New York, who issue it price 40 cents.

New Apparatus.

The Swift-Wheeler Photo-Micrographic Attachment. Made by James Swift and Son, Ltd., 81, Tottenham Court Road, London, W.1.

THIS very simple piece of apparatus provides the means of doing photo-micrographic work with an ordinary camera, and without any alteration of the latter beyond providing a flange to fit the screw of the collar fitted to the attachment. As shown in the drawing it consists of a microscope tube of the standard 160 mm. length, and carrying at one end an ordinary microscopic objective and at the other a Huyghenian ocular of the customary pattern. The object is held in a stage which is mounted on a sleeve sliding over the microscope tube, the stage being provided with a recess to admit

the ordinary 3 × 1 inch microscope slide which is held in position by spring clips. Thus it will be seen that the screwed collar *a* has simply to be inserted into the flange fixed to the lens panel of the camera in order to make the outfit ready for use. Coarse focussing is done by sliding the stage sleeve on the microscope tube, the mechanical workmanship of the pair being so excellent that really quite fine focussing may be done by means of it after a little experience. At the same time the ordinary focussing movement of the camera may be employed for obtaining final sharpness.

As supplied at the price of £5 5s. the attachment is fitted with a 1-inch objective and No. II. ocular of 6 magnifications. With this combination a camera extension of 10 inches permits a magnification of 40 diameters; an extension of 20 inches, one of 80 diameters. The use of a camera of longer extension (one of the old pattern field cameras which can often be bought for a small sum is excellent for the purpose) or of an extension tube allows of still greater magnification. On the other hand the embryo photo-micrographer may provide himself with oculars of higher magnification and can also employ objectives of shorter focal length. The combination fitted in the standard instrument will, however, bring within his range a wide field of photo-micrographic work. We allude in an article on another page to the attractions which such an outfit as this present to those anxious to make a beginning in photo-micrography at small expense and under conditions in which they require to learn little of the technique of using a microscope. Captain Wheeler, while frankly disclaiming great expertness in photo-micrographic work, has kindly shown us a number of photo-micrographs of excellent definition taken with this little attachment of his design. He is to be congratulated on the mechanical perfection with which Messrs. Swift have carried out his idea.

The Graber Eclipse Automatic Rotary Drying Machine. Made by Ellis Graber, 16, Newton Road, Tunbridge Wells.

Mr. Graber, whose machines for the automatic printing, developing, fixing and washing of continuous lengths of photographic development paper deservedly enjoy a very high reputation, has done well to add a further one for the rapid drying of the otherwise

completed bands of prints. The Eclipse machine, which has just been completed for this purpose, follows quite original lines which, so we judge, must make it highly efficient in use. The drying is done by means of heat communicated to the roll by electrically heated rollers in conjunction with a stream of cold air, and is further supplemented by fans which extract the moisture laden air. All these means are operated by the single power unit which drives the machine. The heated rollers are carried on a skeleton drum, each roller, as also the drum itself, being rotated. A further feature of the mechanism is that the heated rollers are allowed a period of rest from contact with the wet paper or card which is being dried, thereby giving each of the twelve rollers a chance to recover its temperature before again coming in contact with the moist paper entering the machine. Moreover, while the paper band passes through the machine at the normal rate of its travel through the developing and washing solutions, the drying machine itself runs at a greater rate, so that a high drying efficiency is obtained within a comparatively small space.

As shown in the photograph, the machine occupies a relatively small floor space, and is designed without the use of any blanket or web for the mechanical absorption of moisture. The coated side of the band of paper, in fact, does not come in contact with anything during its passage through the machine, and hence the latter is applicable to the drying not only of gelatine emulsion papers, but also of varnished or gummed papers, and those coated with an emulsion or sensitised with preparations of the kind used in manufacturing, for example, the iron-printing papers.

There is no doubt that producers of photographs in large numbers in the postcard and allied trades and also manufacturers of sensitive materials will be interested in examining the construction of this new appliance. An opportunity of doing so presents itself during next week, as Mr Graber is including one of the machines in his exhibit at Stand L 12, at the British Industries Fair, opening at the White City, Shepherds Bush, on Monday next, February 27.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, FEBRUARY 27.

Birmingham Phot. Art Club. "The Paget Colour Plate and How It Works." Demonstration. W. F. Carter.
Bradford Phot. Soc. "Amateur Photographer" Prize Slides.
City of London and Cripplegate P.S. "A May Holiday at Lake Geneva." W. Sanderson.
Dewsbury P.S. "Home Photography." A. Dordan Pyke.
Kidderminster P.S. "Passe-Partout Mounting." J. Armytage Batley.
Leeds Camera Club. Lecturette Competition.
Southampton C.C. "The Bromoil Process." C. M. Cooper.
South London P.S. "Mont St. Michel—the Abbey of the Archangel and its Seagirt Town." H. W. Fincham.
Wallasey Amateur P.S. Annual General Meeting.
Walthamstow P.S. "Toning Prints." E. Willcocks.

TUESDAY, FEBRUARY 28.

R.P.S. "Present-Day Portraiture." Thomas Bell, F.R.P.S.
Bournemouth C.C. "Sir Walter Raleigh." F. W. Ibbett, M.A.
Exeter P.C. "Æsthetics of Pictorial Photography." A. W. Walburn.
Hackney P.S. "Enlarging." W. H. Clark.
Leeds Photographic Society. "Assisi." H. S. Chorley.
Morley Photographic Society. Leto Demonstration.
Nottingham Phot. Soc. "Portraiture." Mr. Mills.
Nelson Phot. Soc. "Colour Photography." E. S. Maynard.
Rotherham P.S. "Through the Grecian Archipelago with a Reflex." Messrs. Butcher and Sons.
South Glasgow Camera Club. Lecture. W. S. Denver.
South Shields P.S. "Composition." J. W. Addison.
Stalybridge P.S. Lancashire and Cheshire Photographic Union Slides.
Tynemouth Phot. Soc. "Through the Ægean with a Reflex." W. Butcher and Sons.
Welfare Camera Club. Open Night.

WEDNESDAY, MARCH 1.

Accrington Camera Club. "Bromoil." J. B. Potts.
Catford Camera Club. Members' Queries and Criticisms.
Croydon C.C. "A New Assortment of Travellers' Samples." F. Ackroyd.
Dennistoun Amat. Phot. Soc. Annual General Meeting.
Forest Hill and Sydenham P.S. "Pictorial Composition." H. Sadler.
Halifax Scientific Society. "Folk-lore of Bird and Beast." H. Walker.
Ilford P.S. "Sepia and Platinotype." Rev. J. H. Mitchell.

Leicester Phot. Soc. "Making Lantern Slides." Mr. Croydon. "Mounting the Print." H. Lee Hopkins.
Partick C.C. "Panchromatic Plates and their Uses." John Doig.
Tunbridge Wells Amat. Phot. Assoc. Members' "Colour" Slides.

THURSDAY, MARCH 2.

Camera Club. "Laying of Submarine Telegraph Cables." E. Bevan Bothwell.
Gateshead C.C. Scottish Portfolio.
Hammersmith Hampshire House P.S. "Sicily, the Garden of the Mediterranean, and Scenes in Old Pompeii." Chas. H. E. West.
Letchworth C.C. "Still Life Photography." D. W. Brunt.
Liverpool Amat. Phot. Assoc. "Wonderlands of the Western World." J. Dudley Johnston.
North Middlesex Phot. Soc. Competitions—Prints and Slides. Members' Queries.
Rochdale Amat. Phot. Soc. "Architecture." H. B. Carpenter.
Wimbledon C.C. "More Gems of Architecture." E. R. Bull.

FRIDAY, MARCH 3.

Wombwell Photographic Society. Beginners' Night.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, February 21, the president, Dr. G. H. Rodman, in the chair.

The President announced the gift to the Society by the Kodak Co. of a studio camera, together with full equipment for the development, etc., of Eastman portrait film. He had equal pleasure in announcing that Messrs. Taylor, Taylor & Hobson had presented for use with the camera one of their large aperture lenses of 13 in. focal length. The meeting signified its thanks to these donors by hearty applause.

Mr. G. A. Booth, F.Z.S., delivered a lantern-lecture entitled "Natural History Photography." He dwelt upon the cultivation of the gifts of patience and observation which a study of the wild life of the fields and woods—or even of the suburban garden—promoted, and urged that such study should replace that of some of the abstruse subjects in the curriculum of schools. He depreciated the rivalry in the collection of natural specimens; Nature photography was more useful, and did not involve the extinction of rare species.

He then proceeded to show a large number of lantern slides from his own collection of negatives of British birds, very many of them of remarkably high technical quality. His work had been done with lenses of from 9 to 13 in. focal length, and with a reflex camera, the latter a type which he considered absolutely essential for Nature photography.

On the proposition of the Chairman a most hearty vote of thanks was accorded to the lecturer.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A meeting of the Council was held at 35, Russell Square on February 10. Present:—Messrs. M. Adams, A. Basil, G. Bennett, G. Chase, T. Chidley, A. Corbett, A. H. L. Chapman, C. F. Dickinson, A. Ellis, W. E. Gray, G. Hana, R. Haines, H. C. Spink, H. A. St. George, R. N. Speaight, A. Swan Watson (President), T. C Turner, F. Wakefield and W. Wedlake, with the Secretary (Mr. Lang Sims). Mr. Alfred Ellis in the chair.

Mr. Speaight (Hon. Treasurer) submitted details of the income and expenditure for the past year. After a lengthy discussion the balance-sheet was approved and passed.

The Secretary read the draft of the annual report which he had prepared.

It had been suggested that a covering letter should be sent with the report, giving an explanation in regard to incorporation, and asking members to fill the form, which should also be enclosed.

The Chairman thought that a small copy of the memorandum of the articles of association might be sent. Every member was entitled to a copy, otherwise at the annual general meeting, to be held March 10, the whole document would have to be read through. It was agreed to send a copy.

Mr. Swan Watson said that it was necessary, particularly from the point of view of Scotland, that the P.P.A. "Circular" should be re-started very soon. Members far from London often expressed the opinion that they paid 10s. and got nothing for it. The "Circular" should be something exclusive, and not a mere copy of what appeared in the photographic Press. Members of the Council, perhaps, might write special articles. It was also essential to have a printed list of members.

It was agreed that the matter, with letters which had been received from Mr. Read and Mr. Lambert, should be referred to the Propaganda Committee.

After Mr. Adams and Mr. Turner had spoken as to the urgency of starting a journal, Mr. Swan Watson formally proposed that the "Circular" should be re-started, and that the Propaganda Committee be asked to draw up a definite scheme. The proposition was seconded and carried.

The Council further agreed that a list of members should be published in the first of the new series of the "Circular."

Mr. Speaight said he hoped the various Congress sub-committees would arrange early meetings. The Secretary might be asked to send to the secretaries of these sub-committees the names of the members of each, and a general meeting of the Congress Committee might be called previous to the next Council meeting.

The names of the Councillors serving upon the various Congress Committees were given as follows:—

Finance.—Mr. Speaight, Mr. St. George.

Exhibition, Trade Section.—Mr. Bennett, Mr. Chase, Mr. Corbett, Mr. Wakefield.

Exhibition—Picture—Home.—Mr. Marcus Adams, Mr. Basil, Mr. Corbett, Mr. Speaight, Mr. St. George, Mr. Wakefield.

Exhibition—Picture—Colonial and Foreign.—Mr. Marcus Adams.

Propaganda and Catalogue.—Mr. Barratt, Mr. Bennett, Mr. Haines, Mr. Hana, Mr. Wakefield.

Entertainment and Music.—Mr. Chase, Mr. Ellis, Mr. Gray, Mr. Chidley, Mr. Lambert, Mr. Bertram Park.

Lectures and Demonstrations.—Mr. Haines.

Assistants' Meetings.—Mr. Marcus Adams, Mr. Basil, Mr. Chase, Mr. Hana, Mr. Speaight, Mr. Wedlake.

Lantern, Special Lighting.—Mr. Chaplin, Mr. Dickinson.

The Secretary read a letter asking for information as to the terms arranged with the Westminster Electric Light Corporation, Ltd., and Mr. Corbett said that the correspondent should be reminded that the Electricity Commissioners were the governing body for the City, and had decided that the rate should be uniform all over London. All the stations would eventually be under one control, but not perhaps for about six years. No particular charge could be enforced on the company.

Commercial & Legal Intelligence.

LEGAL NOTICES.—At an extraordinary general meeting of the members of the Photo Productions, Ltd., held at 1, Eton Terrace, Richmond, Surrey, a resolution was passed to the effect that the company be wound up, and that Mr. C. O. Bartley, of the above address, be appointed liquidator.

NEW COMPANIES.

TEDD CAMERA CO. (LONDON), LTD.—This private company was registered on February 13 with a capital of £1,500 in £1 shares. Objects: To carry on the business of manufacturers of and dealers in photographic cameras of all kinds. The subscribers (each with one share) are: H. D. Richardson, 2, Broad Street Place, E.C., merchant, and D. J. Neame, 10, Throgmorton Avenue, E.C.2, stockbroker. The first directors are not named. Registered office: 2, Broad Street Place, E.C.

THE LATE MR. C. ESSENHIGH CORKE.—We are very sorry to see the announcement of the death, on February 21, of Mr. Charles Essenhigh Corke, of Sevenoaks, in his seventieth year. Mr. Corke had for many years followed the professions of an artist and a photographer, his interests in the latter direction having been very successfully embodied in the Sevenoaks studio conducted first by his son, who died a few years ago, and until the present time by his daughter, Miss Beatrice Essenhigh Corke.

MR. J. M. SELLORS, hon. secretary of the Croydon Camera Club, asks us to point out that his address is 50, Russell Hill, Purley, not 78, Parchmore Road, Thornton Heath, as stated in the latest edition of the Red Book. The latter is the address of the president of the Club, and the result of the error is that communications for Mr. Sellors are constantly delayed. It is not known what the formidable Mr. Sellors is doing to the editor of the Red Book. At any rate those having the occasion to communicate with him will be well advised to take notice of the present intimation.

News and Notes.

ROYAL INSTITUTION.—On Saturday, March 4, Sir Ernest Rutherford begins a course of six lectures on Radio-activity.

POLICE OFFICER'S HOBBY.—The enlargement of criminals' photographs to hang in his study was the hobby of Superintendent Dibben, who has died at Newport Pagnell, Bucks.

COPYRIGHT IN BULGARIA.—In consequence of the accession of Bulgaria to the revised Berne Copyright Convention of 1908, an Order in Council was made on February 6, 1922, under Section 29 of the Copyright Act, 1911, extending the provisions of the Act to Bulgarian authors and works. A copy of the Order may be seen in the Patent Office Library, 25 Southampton Buildings, London, W.C.2.

UNITED STEREOSCOPIC SOCIETY.—This well-known society now has vacancies for three or four new members. It is a postal one, and circulates folios of slides monthly, to which every member contributes one each time it comes round. An annual competition is held for the Walshe Owen silver challenge trophy, and lantern lectures are given monthly during the winter session at headquarters. The subscription is 5s per annum. Particulars from the secretary, Mr. A. T. Mole, 39, Westbere Road, West Hampstead, London, N.W.2.

REVUE D'OPTIQUE.—We have received the first issue of the new French optical journal, "Revue d'Optique, Theorique et Instrumentale," recently mentioned by M. L. P. Clerc, which is being published at 140, Boulevard du Montparnasse, Paris XIV., price 2 fr. 50 per issue. The first number contains a paper by MM. Ch. Fabry and H. Buisson on the Jobin photometer without diffusing screen. There are reviews of new optical instruments, one of which is the elegant Homeos stereoscopic camera of Jules Richard, and of recent books. In subsequent issues it is intended to publish a list of notable articles on optical subjects appearing in the periodical press during the preceding month.

PHOTOGRAPHISCHE KORRESPONDENZ. Owing to the economic conditions prevailing in Austria the Photographic Society of Vienna has been compelled to discontinue for the present year the publication of the monthly "Photographische Korrespondenz," the journal which, since its establishment in 1863, has contained a large proportion of the most important Continental communications in the scientific and technical branches of photography. As a substitute for the twelve monthly issues of the present year a "Festschrift" will be issued, consisting of articles and illustrations. The price of this issue for countries other than Austria and Germany has been fixed at five Swiss francs, or their equivalent.

CONCERNING PRESS PHOTOGRAPHY. The following paragraph is taken from the current issue of "The Journalist," the official organ of the National Union of Journalists.—The time has come for Press photographers to close their ranks. It may be necessary to call those to our aid to whom we are affiliated, and who are already cognisant of the extent to which we are exploited. Hordes of young dads swarm into Fleet Street offering themselves at very low salaries; their knowledge of even elementary photography is a negligible quality. Etiquette and education are not part of their equipment. Perhaps a work-shy photographer with a couple of rooms equipped to turn out photographs for Press work will take them on at fifty-fifty, with instructions to follow the trained man about and do what he does. With three such men, each averaging, say, two publications per day in London alone, this would make a comfortable little income for the work-shy man, who can sit by the fire, smoke his pipe, read through the papers for more stunts for his drudges to cover, meanwhile bringing disrepute on the heads of *bona-fide* Press photographers by their crude behaviour. A few of these men may by chance drift on to an agency at a very low salary, and as long as they turn over up to, say, £80 per month, all is well. They usually cover simple jobs and learn their profession during the meantime at the expense of the competent Press photographer. The fully-trained man is expected to show a turnover from £120 per month. He is expected to keep a swarm of dead heads plus rent, light, power, and then, on the top of all this, a substantial profit for the proprietor. It has been admitted that two good men are the mainstay of an agency. One such man sometimes gets a picture which is published in papers all over the world in papers which he never sees. They are kept out of his way; he might ask for more money. Well, here is what is happening: Two men start in the picture business, one man gets all the dud photographers, who always bring home dud pictures, the other has all the good photographers, who, in eight cases out of ten, bring home the best pictures. The business of the man who employs the good men gradually grows. The proprietor then casts round to see how he can make a bit more. He recalls that he has had a number of applications for jobs from the men whose business is not flourishing; why not take a few of them on and get rid of a few of the better paid men? The firm is made now; he can afford to do so. The top minimum for photographers is £8 8s. Put the good man on a basis of 60—40—that is, 60 per cent, for the man and 40 per cent. for the proprietor. Who would be better off—the man or the agency? Photographers can think it out!

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

PRICES OF PHOTOGRAPHIC MATERIALS.

To the Editors.

Gentlemen,—I am glad to see this matter has been taken up by someone at last.

As a professional photographer I, too, think that we have stood the high prices too long, and beg to put forward a strong protest. After leaving the Service at the conclusion of the war, one naturally expected to have a reasonable chance of resettling to one's business; instead of which it has been a continued source of worry and thought how to cope with the ever-increasing costs. Surely now is the time to expect a reduction of the very high prices now prevailing.

I certainly advise restricted purchases of material until something is done by the manufacturers to help us. Customers are continually asking to have the prices reduced, as in other businesses, but can we safely do so at present?—Yours faithfully,

W. HAIG PARRY.

148, Lunthorpe Road, Middlesbrough.

INVENTIONS IN COLOUR PHOTOGRAPHY.

To the Editors.

Gentlemen,—Permit me to point out that in the mass of citations by Mr. Wall (page 27), there cannot be found a single anticipation of my addition of a non-actinic soluble dye to an unpigmented bichromated colloid film as one step in the production of tenuous relief prints subsequently coloured by dyeing. My patent claim 3 reads: "Incorporating a non-actinic water soluble dye in the sensitised colloid coating, exposing said sensitive coating to light, developing the print, discharging the dye, and then subjecting the print to its appropriate dye bath."

It cannot be true that anyone who did not do what I specified and limited my claim to in my patent anticipated that patent. Patents are constantly being upheld in the law courts on the basis of such [illegible] as Mr. Wall ignores, when he says that Ducos du Hauron, MM. Lumière and Pfenninger anticipated my patent. Others *have* used dyed unpigmented bichromate sensitised films in the process of producing dye-coloured relief prints, but only after the date of my patent. My patent on the use of a dyed gelatine silver bromide [illegible] as one step in the production of a tenuous gelatine relief print through the agency of a developed silver image was not [illegible] and was similarly limited, but its validity was recognised by [illegible] large "interests" who would otherwise have exploited [illegible] themselves, and who actually made tentative advances [illegible] acquiring the patent rights.

Mr. Wall [illegible] and obscures the issue. Barring an occasional [illegible] work he is doing in collating historical [illegible] and admirable. While our point of

view and our opinions are not always the same, I believe we are equally sincere in wishing to establish the truth.

The number of my U.S. camera patent to which Mr. Wall refers has now twice been printed wrong. It is 531,040. It is not entirely true, as asserted by Mr. Wall, that this patent is the same as English patent 2,305, '95, because claims which I was entitled to and obtained in the U/S. Patent Office, I was told were barred in England by disclosures at a public demonstration which I gave in London before the British application was filed, and which I therefore omitted. Obviously, my claim to the original invention of a specific type of camera is not discredited by the fact that some years after someone made one with one of the mirrors at a different angle. Mr. White did not alter the type or make an improvement, and the camera which he did make was subject to claims granted to me in my U.S. patent.—Very truly yours,

F. E. IVES.

1,327, Spruce Street, Philadelphia, January 4.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

H. C.—The addresses you ask for are:—Messrs. Gowans & Gray, 5, Robert Street, Adelphi, London, W.C.2 Messrs. T. C. & E. C. Jack, 35, Paternoster Row, London, E.C.4.

T. C.—(1) Three negatives are taken in succession on a single plate through a ruled screen, which is shifted between each exposure. (2) Apparatus and materials from Move-e-graphs, Ltd., 56-58, Eagle Street, Southampton Row, London, W.C.1.

F. C.—Zinc has not a very long life as a metal for developing solutions, and still shorter for acid fixing solutions. It should not be used for these latter at all. Copper will last very much longer, but the best tank for either is hard wood, either with well-made joints or a hard wood frame with a lead lining.

E. J.—Your space is rather cramped, but you should get good results with three half-watt lamps, one 2,000 c.p.and two 1,000 c.p., placing the 2,000 as main light about 6 ft. from the background and about 3 or 4 ft. to one side of the centre of background; one 1,000 as a side light and one as front high light about centre of background 6 ft. away.

J. S.—Write to Messrs. Pictorial Machinery, Ltd., 7, Farringdon Road, London, E.C.1, for particulars of their transfer bromide paper, which would allow you to make negatives of the character you require very cheaply and easily by means of a multiple back camera such as you can get from Messrs. Jonathan Fallowfield, Ltd., 146, Charing Cross Road, London, W.C.2.

B. H.—(2) No certain method of giving H. & D. or Watkins numbers equivalent to degrees Warnerke. We should say that what was formerly rated as 25 Warnerke is equal to about 100 H. & D. at the present time. (3) So far as we know there is no agent here, but try Messrs. J. F. Shew & Co., 21, Bartlett's Buildings, Holborn Circus, London, E.C.1, who were previously the agents.

F. H.—The usual caulking used for wooden tanks is a stiff mixture of red lead and linseed oil; or the joints may be given a good coating of bitumen paint before being fitted together. Many tanks are sufficiently well made to render any caulking unnecessary, and the presence of a material which in the course of time is liable to perish to some extent is certainly a possible cause of leakage.

E. M.—(1) A condenser could easily be polished for the removal of scratches unless these are very bad indeed. Write to the Premier Optical Co., 63, Bolton Road, Stratford, London, E.15. (2) Do not stint it for size; we should say, roughly, that it should be at least 24 in. × 24 in. high and wide, and not less than about 18 in. deep. (3) Twelve inches is a very good focal length for large cabinet heads.

F. N.—We are afraid that the position you describe is not at all suitable for the erection of a studio. The glass at the end would only tend to flatten the lighting, and the width is too little for the top light to be controlled effectively. If you thought it worth while, you might put in two 1,000-c.p. half-watt lamps to serve as a side light, but if it is to be used only for amateur work, we should recommend you to use an ordinary room where you will have much more manageable light.

F. A.—There is no necessity for a copyright photograph to be marked "copyright." If you took the photograph of the stone laying on your own initiative, that is to say without receiving the order from anybody to whom you would look for payment, the copyright is absolutely yours. The only circumstances in which the other photographer would be entitled to make the copies are that he received the order to do so from the person who, in the first instance, gave *you* an order to take the photograph. But we infer from your letter that no such person exists.

W. H.—Eight 1,000 lamps will be ample, probably six will be sufficient. These should be arranged in a curve, or L shape if more convenient. Use *thin* white nainsook or madapolam for diffusing screens and white reflectors. The hemispherical reflectors, sold by the General Electric Co., are excellent, but are rather costly. By all means arrange to have the lamps to raise and lower, as this greatly shortens the exposure with sitting figures and children, besides giving more control of the lighting. No. 7 may be used instead of a reflector it gives rather better modelling. It is a good plan to fix the lamps under the solid side of the roof, so as to avoid interference with daylight working.

H. P.—The name Heliotype is usually applied to a modification of the collotype process, invented by Ernest Edwards many years ago. A waxed glass plate is given a substratum of bichromated gelatine containing a little chrome alum, and this film, after drying, is stripped off and the surface, which previously had been next to the glass, exposed under a reversed negative in the usual way. The other side of the exposed film is hardened by exposure to light, and is mounted on a metal plate coated with india rubber. The bichromate is then washed out and the plate is ready for printing. You can get photo-litho paper from Messrs. Penrose & Co., 109, Farringdon Road, London, E.C.1, but so far as we know only in one surface.

F. N.—(1) For all-round work a lens of from 8 to 10 inches focal length will be quite suitable; for reduction to lantern size one of about 5 inches will be best. Much depends upon the bellows extension of your enlarger. You would require at least 15 inches draw to make a lantern slide from a half-plate with a 5-inch lens. (2) It is a matter of taste as to which way to place a half-watt lamp in the lantern. Some prefer to turn what is normally the bottom towards the condenser, but we prefer to hang the lamp in the usual position, and to tilt it slightly so that the whole of the filament is effective. In either case you will have to place a piece of finely-ground glass as close to the lamp as possible to secure even illumination. About 200 c.p. is sufficient.

The British Journal of Photography

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. PRICE FOURPENCE

TERMS OF SUBSCRIPTION POST FREE.

UNITED KINGDOM OR CANADA.—*One Year*, £1 1s. 8d.; *Six Months*, 10s. 10d.; *Three Months*, 5s. 5d.

ANY OTHER PART OF THE WORLD. *One Year* ..... £1 3s. 10d. *Six Months* ... 12s. 0d. *Three Months* 6s. 0d.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibits the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3226. Vol. LXIX. FRIDAY, MARCH 3, 1922. Price Fourpence.

Contents.

SUMMARY.

A scale or calculator for ascertaining the time of development by making appropriate allowance for the temperature of the developer and the development speed of the plate when using a pyro-soda developer is the invention of an American worker. (P. 123.)

In a leading article we deal with the copyright question concerning the making of photographs bearing a close resemblance to others made previously (P. 122.)

Further experiments in hypo-alum toning have been carried out by "Thermit," who gives a most practical method of accelerating the process of toning bromide prints. (P. 126.)

A multi-printing frame for use in producing multiple designs, images, etc., on plates and stones in one or more colours is the subject of a patent. (P. 127.)

A temporary arrangement for holding lenses in position on a camera front during testing is described on page 121.

The usefulness of a motor-cycle to photographers is described by a correspondent, who gives some helpful details. (P. 125.)

Special attention is called to the advantages of a permanganate-sulphuric reducer, a very much neglected but most useful solution. (P. 121.)

A simple method of testing whether a fixing bath for prints is working at active strength will be found on page 122.

The eighth of an unbroken series, the British Industries Fair opened at the White City, London, W., last Monday. Cinematography is well represented. (P. 131.)

Lecturing at the Camera Club, Mr. Arthur Banfield declared that, if properly used and not abused, the Bromoil process is one of the most beautiful which photographic science has given us. His method of working is fully described on page 130.

The paste-on method of making combination prints was very strongly advocated at the Croydon Camera Club, and several excellent specimens in support of the method were shown. (P. 129.)

"COLOUR PHOTOGRAPHY" SUPPLEMENT

Facts and fallacies in colour photography are dealt with in an article by Lt. Com. H. E. Rendall, who gives an instructive criticism of one-exposure cameras for the making of the three images. (P. 9.)

A French-Italian system of colour cinematography is described on page 10. A method of optical printing of side-by-side positives from negatives taken alternately through green and orange filters is adopted.

Mr. F. J. Stoakley dealt fully with the progress of colour photography before the Camera Club last week, showing a remarkable series of examples of both current and obsolete processes. (P. 12.)

EX CATHEDRA.

A Simple Lens Holder. It is sometimes necessary to make a temporary arrangement for holding a lens upon the camera front for testing purposes. It must be strong enough to preclude the possibility of accident and rigid enough to keep the lens-axis normal to the plate, while it should not necessitate much work in setting up. The universal iris adapters which were at one time common were excellent, but, we believe, are no longer on the market, while their cost was rather too high if they were not often required. A simple and perfectly effective device consists of a stout card large enough to cover the hole in the lens panel. In this card is cut a hole into which the screw-thread of the lens mount fits fairly well, the lens fitted in and the flange screwed firmly on the inner side of the card. The whole is secured to the front by four or more good push pins. In the case of cameras with very small fronts the card may be cut to fit into the recess, the panel being dispensed with. Spare panels for permanent use may be made of very thin three-ply wood; the latter is better than cigar-box wood, which is very liable to split. The opening may be cut with a fretsaw or even with a penknife, and rebates, if needed, are better made with a file than with a knife or plane. A coat of varnish stain will make such a panel quite presentable.

* * *

A Neglected Reducer. Many photographers are not fully aware of the advantages offered by the permanganate sulphuric acid reducer. It is cheap, its action is certain, safe, and easily controlled, and the solution keeps fairly well. A formula may be found in the current issue of the "Almanac," or the reversing solution employed for the Autochrome plate may be used, diluted to about double its normal strength. The reducer should not be employed until after a negative has been well freed from hypo, and should not be used for a dry negative, the latter being soaked for ten minutes, unless the greatest degree of reduction is required in the high-lights. If it is needed to reduce harsh high-lights in a portrait negative or windows in an interior, the negative should be dry and put straight into the reducer, which will then attack the high-lights before the shadows, and by the time the action has started upon the latter, the reduction on the high-lights will probably have gone far enough. The action of the reducer is rapid, and it should be diluted if only slight reduction is needed, and the progress watched carefully. If a very great reduction of contrast is required the dry negative may be treated, washed and dried, and then, when dry, a second application of the reducer may be given. Care is needed when doing this, and it should only be contemplated in extreme cases. The solution should not be used after being kept a long time, when it becomes cloudy; it then tends to act unevenly or produce brown stains upon the negative. If these

occur they may be removed with a 10 per cent. solution of sulphite of soda, to which 2 per cent. of oxalic acid has been added.

* * *

A Test for Fixing. We do not think that we are very far from the truth in saying that the fixing bath is among the things generally neglected by the average photographer who, so long as he gets no trouble from so doing, is inclined to make up the stock solution haphazard, without weighing, and in all probability uses the bath long after its action as a fixer is considerably lessened. Many a case of blisters, frilling, etc., can be traced to the use of too strong a fixing bath, particularly with some of the modern emulsions which are so finely adjusted that to depart very far from the makers' instructions and formulæ is to invite trouble. Some time ago we were consulted as to why a certain batch of prints blistered, whereas others upon another make of paper at the same time and in the same bath exhibited no signs of the defect. Subsequently, it was shown that the fixing bath was actually twice as strong as recommended by the maker of that particular paper. Though hypo is cheap, many photographers are inclined to overwork their fixing baths, as a simple test will show. If a piece of bromide paper is taken and placed in a sulphide solution as used for sepia toning, it will be found to turn rapidly to a dark-brown colour. If it had been previously fixed and washed the sulphide would have had no effect upon it. Thus it will be seen that the worker has to his hand not only a means of testing whether a particular bath is still working at active strength, but by immersing a piece of bromide paper in strips, for various times, he will also gain an idea of the time needed for the fixing bath to perform its function with any particular brand of paper.

SIMILAR SUBJECTS OF PHOTOGRAPHS IN RELATION TO COPYRIGHT AND CONTRACT.

Among the questions relating to copyright, which present difficulties by reason of the somewhat obscure meaning of the law in regard to them, are those which are concerned with photographs which exhibit a close degree of similarity in consequence of very similar subjects having been photographed. Such questions are not simply the product of an imagination fertile in discovering imperfections in the Act, but frequently arise in everyday commercial transactions. Enquiries which turn upon this question frequently reach us, and are difficult to answer, except at a length and with a knowledge of the exact circumstances which are not always at disposal. It may, therefore, be of advantage if we endeavour to set forth with as much precision as is possible the considerations from which an individual photographer can draw conclusions for his guidance.

A fairly typical case of the problem is somewhat as follows:—A photographer is asked to make a costume study for an advertisement to be used by a commercial firm, his customer. He engages a model, and after having taken the photographs for the purpose of carrying out the order, makes one or two further exposures for himself under the idea that, if he does not offer these to his customer, he obtains the rights in them himself and can make use of them in other directions. When he does so—we are describing an actual case—he finds that his customer objects on the ground that the photographs are so closely similar to those taken in execution of his (the customer's) order that they are an infringement of these latter.

Under the now repealed Copyright Act of 1862 it was clear from Section 2 that, so far as copyright is concerned, a photographer was within his rights in doing as above described. The Section, which is entitled "Copyright not to prevent the representation of the same subjects in other works," declared that "nothing herein contained shall prejudice the right of any person to copy or use any work in which there shall be no copyright, or to represent any scene or object, notwithstanding that there may be copyright in some representation of such scene or object." This provision, however, does not occur in the present 1911 Copyright Act, and, in fact, it is difficult to discover anything in the Act which represents an equivalent liberty to create copyright separately as the property of the photographer and the customer in such circumstances as those which we have taken for our example. On the other hand, the Act defines copyright as the sole right "to produce or reproduce" the work or any substantial part thereof, etc. We cannot help thinking that the word "produce" is not used without some significance attaching to it, and it may be thought that the framers of the Act had in their minds such cases as these in which an artist produces a subject which he then embodies in a pictorial form (drawing or photograph) for a customer. If we draw this inference from the use of these words, then it is obvious that any further photographs which are made of the same subject (providing that they are closely similar to those made for the customer) would be an infringement of the latter. Unfortunately for this view of the Act's definition of copyright, the only case in the Courts which we know of as bearing on the point does not support it. In the High Court in August, 1917, a judgment was given by Mr. Justice Peterson in a case arising out of a dispute between two postcard publishers. Publisher A had produced a picture postcard representing a soldier reading the day's orders, which ran: "Eight hours drill, eight hours route march, either hours trench work." Underneath the drawing was the sentence "Then we have the rest of the day to ourselves." Another publisher, B, had issued a postcard of a similar kind, which also depended for its humour on the inscription below the drawing "Rest of the day to ourselves." On publisher A taking action against publisher B for infringement it was held that there was no copyright in an idea, but only in the expression of an idea, and that on this score the two cards were dissimilar. The case, however, is not quite on all fours with that which we have instanced. For one thing, we imagine that the two drawings differed considerably, but, more important, the originals were independently created by different people. It is in regard to this latter point that a photographer involved in such problems as these will, we think, be most securely guided.

For even if we do not stress the view which appears to be justified by the definition of copyright in the present Act, namely, that copyright involves production as well as reproduction, due attention must be paid to the particular circumstances. In the case which we have taken as an example we think there is an implied contract, quite apart from considerations of copyright, to the effect that the photographer is applying his services and facilities wholly to the customer in producing an original work from the life model, and that, therefore, the production of other versions of the subject closely resembling those which he supplies for the use of the customer is a breach of that implied contract. From this point of view it is quite conceivable that the High Court judgment of 1917, which we have quoted, would have been very different if the two originals had been produced by the same person and had been supplied to different publishers, and if the action had been taken

on grounds of breach of contract. So far as the wording of the present Act is concerned, comparatively little help is given towards the solution of these difficulties. There is certainly nothing in the Act which suggests that a photographer is infringing anybody's rights when he takes a photograph of some natural scene or view from such a view-point that the result is practically identical with photographs which previously have been taken. It is, as we have suggested, chiefly when the question of breach of implied contract enters into the case that attention must be paid to it, at least, as much as to that of copyright law. The only judgment within our knowledge which bears directly on these questions is one in a United States Court in a case in which a photograph of a girl was made and copyrighted as "Grace of Youth," and all rights therein sold by the artist. Two years afterwards the same photographer took a picture of the same model in practically the identical pose of the first picture, except that the girl was smiling and had a cherry stem in her mouth. In the legal dispute which arose in reference to this latter work, which was called "Cherry Ripe," it was held that any other artist could have used the same material and have made a new picture so closely resembling the copyrighted one that it would pass for it without infringing the copyright. But when the same artist did this, he was considered to be using the experience gained in taking the first picture in making what was in many ways a duplicate of his first picture, the rights in which he had sold. In these circumstances the law did not protect him.

A CALCULATOR FOR TIME DEVELOPMENT.

[In the following article in "American Photography" the author, Mr. Leo Kraft, describes a scale or calculator for ascertaining the time of development by making appropriate allowance for the temperature of the developer and the development speed of the plate when using a particular pyro-soda formula.]

It is always more or less difficult, in the dim red light of the dark room, for even the most experienced photographer to judge by inspection of the plate just when development is complete. This is more particularly true in the case of the average amateur photographer who develops plates or films only occasionally, and whose views cover a wide range of subjects, as even with all other conditions the same, two different types of views may appear to be quite different at the time development is complete. If one is using different makes of plates or films or double-coated plates, any inspection method of development is still more difficult, as the various emulsions will cause the negatives to appear different at the time development is finished. Some plates fix out more in the hypo than others, which is a further condition to be allowed for. There used to be a belief that a cold developer produced thinner negatives than a warm developer, but this was largely due to the fact that development was often stopped too soon, which might readily happen when attempting, by inspection, to determine the proper development time. Given two negatives of the same view, on the same brand of plate, and developed with the same developer, at different temperatures within the range usually met in practice, if the development has been timed on the basis of the temperature it will usually be impossible to distinguish between the negatives, while the prints made from them will be almost identical.

One other idea which many photographers still cling to, is the notion that it is possible to put individuality into a negative by special manipulation during development. Ruling out a very small percentage of special views, I think this idea may be readily disproved to anyone's satisfaction by simply trying the experiment. Views containing extreme contrasts, such as interiors showing brightly-lighted windows, should have special development, but practically all other views, from portraits to copies of black and white drawings, need no special treatment. These subjects certainly constitute over 95 per cent. of the average negatives. I have developed portraits on many different plates and films, groups, flashlights, landscapes, and even copies of black and white drawings on process plates, all in the same developer by a strict adherence to the rules and methods to be described, and not only have the results been entirely satisfactory in every case, but I am positive that the general run of negatives has averaged much higher than would have been obtained by any other method.

Any number of arbitrary rules have been proposed to enable one to determine just when the plate should be removed from the developer, but the very fact that these rules are so varied shows that little reliance is to be placed on any of them. That there is, however, no need for any uncertainty in development has been clearly demonstrated many times, and if the developer is mixed according to the same formula, its action on any brand of plate will depend only on the temperature. That is, the time required for complete development will vary with the temperature in a definite and fixed ratio for the developer used, and having determined this ratio once and for all, the time required may always be definitely known. Different brands of plates require different times for development, but this also will be a fixed quantity to be determined once and then used thereafter.

Two general methods have been proposed for determining the time required for development, one of which is known as the factorial method and the other as the time and temperature method or thermo-method. The factorial method is based upon the ratio which the time required for the first appearance of the image is assumed to bear to the total time required for complete development. With the factorial method, the time measured for the first appearance of the image, after the developer is applied, is multiplied by a known number or factor, the result being the total time required for development. Suppose that with a developer whose factor is known to be 12, it is found that the first appearance of the image occurs 16 seconds after the developer is applied. Then 16 times 12 gives 192 seconds or practically 3¼ minutes, the time required for complete development.

This factorial method has many drawbacks, and the writer does not recommend its general use. With an over-exposed plate the image may appear almost immediately after the developer is applied, and if the factorial method is used, development will be stopped too soon. With an under-exposed plate, the reverse is true, the image may not appear for some time after applying the developer, resulting, if the factorial method is used, in over-development. Often with correctly exposed plates, one view may contain bright high-lights which will appear before any other part of views, again resulting, when the factorial method is used, in incorrect development. Also, with the same developer, different brands of plates may show different factors, while changing the dilution of the developer or the temperature may also change the factor.

Development carried out by the time and temperature method will result in uniformity of negatives, producing perfect negatives with correctly exposed plates, and with under-exposed or over-exposed plates the best negatives possible under the circumstances. As there is no need for inspection of negatives during development, the process may be carried on in absolute darkness if required. It will also be possible to adjust the process so as always to obtain any desired degree of contrast to suit one's particular taste or to accommodate any special printing process.

There have been several time and temperature methods

proposed. but they may be roughly divided into two classes; in one class the *time* of development for different plates at the same temperature is always the same, the dilution of the developer being varied for the different plates. In the other class, the *developer* is always used at the same strength, the time being varied for the different plates. With the time and temperature method I am describing, the developer is always used at the same dilution for dish use, and always the same for tank use, the tendency of different brands of plates to develop faster or slower being taken care of by a development speed number previously determined. The tendency of a plate to develop rapidly is indicated by a high speed number, while the tendency to develop slowly is indicated by a low speed number. When this speed number is once determined for any brand of plate it need never be varied, unless for some special reason one desires to change the degree of contrast, in which case decreasing the speed number will give greater contrast, while increasing the speed number will give less contrast.

In order to facilitate the determination of the proper development time by the use of the speed numbers the development calculator illustrated herewith has been prepared. It may be made by pasting figs. 1 and 2 on a piece of fairly

SPEED NUMBERS

Plate or Film	Speed Number
Hammer Red Label	25
Kodak Film	20
Portrait Film	30
Seed Graflex	25
Seed 26X	30
Seed Process	5
Speedex Film	15
Standard Orthonon	35
Standard Polychrome	30
Stanley 50	35

INSTRUCTIONS

Time-Temperature Method

Add speed number of plate to temperature of developer. Set index arrow marked "Tray" or "Tank," as the case may be, at this sum, and the hand will then point to total time for development.

Factoriel Method

Set developer factor at time required for first appearance of the image, and the hand will then point to total time required for development.

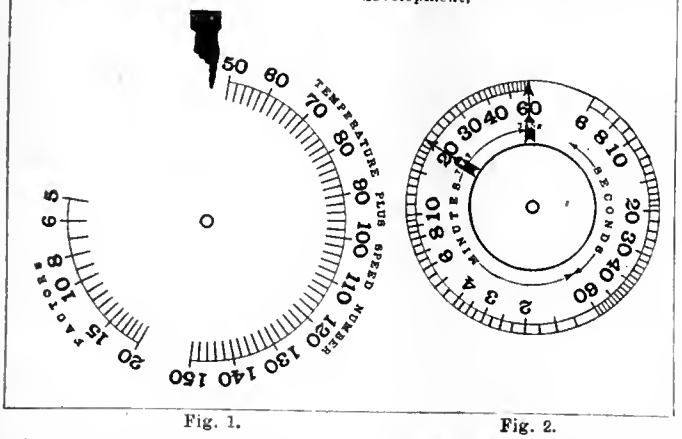


Fig. 1. Fig. 2.

stiff cardboard, then cutting out the disc, fig. 2, and mounting it by means of a rivet or eyelet, so that the centre corresponds with the centre indicated on the rectangular piece, fig. 1, and so that the disc may be rotated on this point. To use the calculator, the previously determined speed number is added to the temperature (in degrees Fahrenheit) of the developer, and the disc on the calculator turned until the tray or tank index arrow, depending on the dilution of the developer, points to this sum. The hand will then point to the time required for development, this being the total time the plate should be in the developer solution. The speed numbers for most makes of plates and films will range from about 25 to 40, those for roll films being somewhat lower. These speed numbers will give negatives which print well on medium grades of gaslight paper and which will enlarge on bromide or other enlarging papers. The appended table of speed numbers should be used only as a guide, and each operator should make his own table to suit his own particular requirements.

Determining speed numbers is not difficult, and, as the average photographer uses comparatively few different brands of plates or films, it is easily done. To determine the speed number, take a plate or film which has been given, as nearly as possible, the correct exposure, and develop it with the developer properly diluted for tray or tank, as the case may be, noting the developer temperature. Carry development to what appears to be the correct point, determining this by any method the photographer is in the habit of using, and note the total time the plate is in the developer. Now turn this disc on the calculator so that the hand points to the development time found by the above trial. The proper index arrow will then point to the sum of the temperature and the speed number. Then if the temperature of the developer is subtracted from this sum the result will be the speed number which is to be used in the future for that brand of plate. After the negative is finished and a print made, one can decide whether development was correct, too long, or too short, and vary the speed number accordingly in another trial. Usually two or three trials should definitely determine the speed number for any brand of plate.

Suppose, for instance, that with a certain brand of plate it was found that $3\frac{3}{4}$ minutes were required to correctly develop the plate in the tray to the required density when the temperature of the developer was 65 degrees. Turning the disc on the calculator so that the hand points to $3\frac{3}{4}$ minutes, the tray index arrow will be found to point to 95. Then 95 less 65 (the developer temperature) will give 30 as the speed number of that plate, which should be used in the future for all plates of the same brand.

The calculator must only be used for determining development by the time and temperature method when the developer is compounded after the formula given herewith, which is for the well-known pyro-soda developer, which is in almost universal use and one of the cheapest to prepare. It has good-keeping qualities, but we do not recommend mixing up more than about one month's supply at one time, although we have repeatedly used developer much older than this with good results. The impurities in the water and the amount of air in solution affect the keeping qualities to a great extent, the sulphite solution being particularly subject to spoiling, which will result in stained negatives. With any developer, the best results are always to be obtained when the solutions are fresh. Boiled or distilled water may be used when preparing solutions, but unless the water supply is very bad this is not necessary. As a rule, if the water is fit for drinking it will be suitable for making up the solutions. The water for diluting the stock solutions just before use should have stood in the dark room long enough to have attained a constant temperature, as otherwise the temperature may change during development, although seldom, except with the tank, enough to materially affect results. The 4 ozs. of developer for tray use is sufficient for a 7 × 5 plate, and the quantity shown for tank use is correct for the 7 × 5 Eastman plate tank. If different quantities are required they should, of course, be diluted in the same proportion.

The developer to be used with the calculator is compounded as follows:—

Stock Solution A.	
Water about	8 ozs.
Potassium metabisulphite	55 grs.
Potassium bromide	7 grs.
Pyrogallic acid (pyro)	330 grs.
Water to make	16 ozs.
Stock Solution B.	
Sodium sulphite (dry)	600 grs.
Water to make	16 ozs.
Stock Solution C.	
Sodium carbonate (dry)	425 grs.
Water to make	16 ozs.
For use in dish take	
Solution A	3 drs.
Solution B	3 drs.
Solution C	3 drs.
Water to make	4 ozs.
For use in tank take	
Solution A	2 ozs.
Solution B	2 ozs.
Solution C	2 ozs.
Water to make	64 ozs.

Always use the developer immediately after mixing the stock solutions and water together, as it will not keep when mixed. Always use fresh developer for each tray or tankful of plates. Do not try to use the developer a second time, as the chemicals which have been dissolved from the plate during the first use will affect the time and quite often the colour of the negative. Even with present-day retail prices for chemicals the cost of sufficient developer for one 7 × 5 plate in the dish is only about one cent, and it would be poor economy to run the risk of spoiling a plate costing some ten times this amount by using the developer a second time.

While not recommended for general use the calculator may also be used with the factorial method. For this purpose set the disc so that the time required for the first appearance of the image is opposite the known factor of the developer, and the hand will then point to the total time required for development. The calculator shown in fig. 3, B, is set for the following data :—

Factor	11
Time for appearance of image	18 sec.
Total development time	3 min. 20 sec.

When using the factorial method the calculator may be used with any developer, providing the factor is known. With the pyro developer compounded after the formula given above the factor will be found to be about 11.

After many years experience in developing plates and films, and after experimenting with a great number of development methods, the writer unqualifiedly recommends the time and temperature method of development as being the most accurate that he knows of. The photographer of small experience can make no mistake in adopting it, while the photographer of somewhat more experience will probably be surprised to see the difference in his work if he will abandon his inaccurate methods and adopt the time and temperature method for determining the developing time. The writer believes that the trend is more and more away from the slipshod, hit-or-miss methods of former days, and that there is a definite tendency toward precision in all photographic operations from the calculation of the exposure to the making of the finished print. If solutions are compounded with reasonable care, a strict adherence to the time and temperature method as shown by the calculator will be found to give uniformly good results, eliminating all tendency to over-develop or under-develop, even when the plate has been improperly exposed.

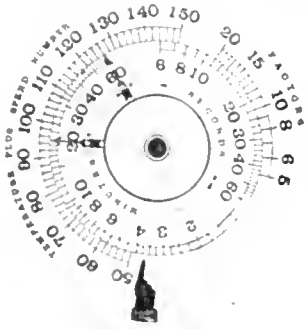


Fig. 3A.

Fig. 3B.

LEO KRAFT.

THE MOTOR-CYCLIST PHOTOGRAPHER.

DURING the course of a year the average provincial photographer has many country outdoor appointments involving journeys of, maybe, five, ten, twenty, or even more miles from the studio.

If the operator is dependent on railway or public bus transportation half a day, or more, may elapse between the times of his departure from and return to the studio.

It often happens that railway time-tables do not fit in with the hour of the appointment, and a good deal of time is wasted on the outward and return journeys. The remarkably rapid development of the post-war country motor-bus affords an alternative to travelling, inasmuch as their times of departure and return may be more frequent or suitable to particular needs; moreover, one may alight at any point on the route traversed, and, it should be remembered, some of these stages are inaccessible by rail.

In either case, however, a loss of valuable time is almost inevitable, for, apart from time lost while waiting, neither train nor bus puts one down on the doorstep of the address sought; indeed, it frequently happens that some distance remains to be covered on foot.

During the present period of trade slackness and reduced staffs it may be most essential that the operator should be able to return to the studio at the earliest possible moment, therefore arises the question as to how these distant jobs may be undertaken and executed with as little inconvenience and as much expedition as possible.

The Question Answered.

I can assure those who are situated where straggling, outlying districts abound that there is no more inexpensive or expeditious aid to the keeping of distant appointments than the light-weight motor-cycle.

It is not so many years ago since a journey by motor-cycle might have been regarded as much in the nature of an uncertain expedition; the motor-cycle of to-day, however, is probably as reliable as any other form of speedy travel, consequently the motoring photographer may compile his own time-table; furthermore, the machine carries rider and apparatus to the very door of his clients.

One may start out on a five-mile journey, as I have done, say, at 1 p.m., expose half a dozen plates, and return, ten miles in all, in time to keep a studio appointment at 2 p.m. Similarly, it is possible to travel a distance of twenty miles out, execute the business, return, and be busy in the studio in less than three hours. These examples demonstrate not only the value of the motor-cycle as a time-saver, but the opportunity afforded the single-handed operator for undertaking extra appointments when occasion demands.

Helpful Details.

Personally, I ride a 2½-h.p. two-stroke—commonly known as a "potter-bus," on account of its light weight and handiness for "pottering" about on short trips—and I can particularly recommend this type for the purpose.

The weight of my machine is about 120 lbs., therefore no undue exertion is required to handle it; the simplicity of its engine renders it exceedingly reliable mechanically, therefore no special mechanical knowledge is necessary, and this is a most important point to the non-technical motorist.

In my own case I have covered 2,500 miles during the past six months, and no mechanical trouble has been experienced over this distance, while, as regards tyres, 2,300 miles have been ridden since the encounter of a puncture. Running costs, including fuel, oil, and wear and tear, work out at approximately 6s. per 100 miles; compared with the railway charge of 14s. 7d. it will readily be understood that a machine soon pays for itself, apart from saving the photographer money in the form of time.

Keeping an Appointment.

While writing about motor-cycles, I have to bear in mind that this is a photographic journal, and I can only insert so much mechanical matter as is necessary to interest the photographer. Assuming, therefore, that I have so far interested the reader who has something to do with country outdoor work, it may be presumed that further details on the keeping of an appointment by motor-cycle will be welcome.

First of all I make certain that the machine itself is in good order in every respect, then the camera is made ready. After thoroughly cleaning the interior of the dark-slides, so that dust and vibration may not result in a pinhole plague, the camera—up to whole-plate—and tripod are mounted and securely strapped on a "Tan-Sad" spring pillion seat, which is fixed on the carrier. This completes the equipment of the machine; the remaining preparations are the personal matter of dress.

To many minds motor-cycling is synonymous with a rider covered in oil and mud. Long-distance riding and a dirty machine—a machine which flings both oil and dirt—is certainly not conducive to a presentable business appearance. I have the good fortune to be the owner of a machine which, while offering no special protection, runs cleanly in the dirtiest of weather, and it at no time flings oil on to the clothing. A good set of waterproof overalls are advisable, however, as a protection against dust or rain. Personally, I remove these outer garments on reaching my destination, so that I may appear decently tidy.

Starting Out.

I have remarked that the motor-cycle is trustworthy, the one uncertainty is the ever-present possibility of tyre trouble, and, if the time allowed for the outward trip is cut down to a minimum, a puncture may be awkward. Therefore, it pays to keep the tyres in good condition; moreover, it is policy to base the time of the journey on a seventeen-mile-per-hour basis, then, in the unlikely event of a deflated tyre, it should be possible to make a repair and still arrive on time by travelling the remaining distance at speed, if necessary. Fortunately, one is not so liable to tyre troubles on short distances, any loss of time on a long journey can be regained, as pointed out, by a higher average speed. The return trip is made in quick time.

Conclusion.

I should not have done my subject justice had I not suggested the utility of the motor-cycle for those who make a speciality of dashing off to photograph accidents and the like either for the Press or for display purposes. In such cases speed is everything, and for these unexpected happenings the motor should always be kept in readiness for instant use. Finally, business apart, motor-cycling is a most healthy and invigorating pursuit for sedentary workers such as we photographers are. "PRUDENCE."

FORTHCOMING EXHIBITIONS.

February 18 to March 4.—Edinburgh Photographic Society. Particulars from the Hon. Secretary, G. Massie, 10, Hart Street, Edinburgh.

March 1 to 6.—Birmingham Photographic Society. Particulars from the Hon. Secretary, P. Docker, Medical Institute Buildings, Edmund Street, Birmingham.

March 4 to 25.—South London Photographic Society. Particulars from the Hon. Secretary, Harry Abbott, 61, Beauval Road, East Dulwich, London, S.E.22.

March 8 to 9.—Birkenhead Photographic Association. Particulars from the Exhibition Secretaries, Messrs. Longstaff and Trace, 33, Hamilton Square, Birkenhead.

March 14 to 16.—City of London and Cripplegate Photographic Society. Latest date for entries, March 4. Particulars from the Hon. Secretary, J. J. Butler, 7, Gresham Street, London, C.2.

ACCELERATED HYPO-ALUM TONING.

SINCE writing in the "B. J." for February 10, I have carried out further tests with the idea of working out a practical method, giving the advantage of speed without unduly adding to the work or trouble.

Having done this to my own satisfaction, I am setting down the procedure for the benefit of hypo-alum users who care to take advantage of it.

The hot bath used is compounded with 1 lb. of hypo and 4 oz. of white (potass) alum, dissolved in 80 oz. of boiling water. The amount first put into use is ripened by the addition for a few minutes of about 18 sq. inches of old or spoilt gaslight paper per oz. If bromide paper is used, less suffices. The method of ripening advocated by Messrs. Illingworth and others is at least as good, but I find the addition of old paper to be quite satisfactory. This ripening is only done with the first dishful, the stock being kept unripened. Each day, immediately before heating up, the bath is well stirred and a few ounces are poured away, the deficit being made up with fresh stock. In this way it is possible to keep the bath working well indefinitely. No water bath is necessary, as the prints tone rapidly while watched.

For fixing the prints, a plain hypo bath will simplify matters. From this bath the prints are removed to a solution of sulphuric acid, of a strength of about 8 per cent. Weaker acid will serve, but I have had the best results when using stronger solutions. Above 10 per cent., however, there is a tendency to carry too much acid into the toner, with the result that powerful fumes are given off. Those acquainted with sulphuric acid will not need any caution about its use, but it may be as well to point out that the strong acid is dangerous and must not be allowed to touch the bare fingers or be diluted by the pouring in of water. Water falling on strong sulphuric acid will cause violent ebullition, with possible personal damage. The acid must always be poured into the water. I mix a winchester of the weak solution, which can be used in perfect safety, the concentrated stock bottle being kept out of the reach of young assistants.

After a good turn over in the acid, prints are put into the toner, where with constant turning they tone very rapidly. In a very hot bath I have had tones in as little as thirty seconds.

If prints are fixed in compound fixing baths, it is safest to rinse them and re-soak in plain hypo before treating with acid. For this purpose a strong solution—I have tried saturated and 30 to 40 per cent. strengths with satisfaction—can be kept and used repeatedly until it is all used up. One minute will suffice in the hypo bath provided the print is well immersed and turned, but two or three minutes will do no harm unless the print is already over-fixed, when some little reduction may possibly occur. I limit the immersion in both hypo and acid to a maximum of two minutes at 65 deg. to 70 deg. F., and in no case have I had any reduction or degradation.

For the acid treatment, hydrochloric will serve equally well, as will certain other acids, but there is the advantage in using sulphuric of not introducing new compounds into the toning bath, this acid being related to the salts already there. Traces of hydrochloric acid might reasonably be expected to produce common salt in the bath, and possibly other things, and in time the composition of the bath might be so altered as to affect the tones. No difference is discernible, however, in two prints which have been treated with different acids, and toned at the same time, or at least I have not been able to get different tones this way.

With regard to stains, I believe that there is less risk of spoils with the accelerated treatment, but stains caused by improper fixing are not entirely obviated. I have had a print half-toned in the usual way apparently refuse to go further until taken out and treated with the two baths, when on re-immersion in the toner it promptly finished toning; other prints which were manifestly "stained"—suffering from bluey patches where presumably fixing had not been complete—refused to answer to any treatment. If the same kind of stains can be produced by "cooked" gelatine, as was suggested in America some few years ago, the cooking also affects the image, for, when intending to produce such marks by overheating, I got them after the whole print had toned.—THERMIT.

THE will was proved last week of the late Mr. Sigmund Guiterman, of Aldermanbury, London, E.C. £45,712.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, February 13 to 18 :—

CAMERAS.—No. 4,312. Roll-film photographic cameras. A. J. Dennis, V. W. Edwards and Houghton-Butcher Manufacturing Co., Ltd.

APPARATUS.—No. 4,525. Apparatus for treating photographic plates, films, etc. T. J. Doyle.

DRY-PLATES.—No. 4,218. Photographic dry-plates. K. Wiebking.

MOUNT CUTTING MACHINE.—No. 4,546. Photographic mount, etc., cutting and bevelling machine. F. Worthington.

PRINTING-BOXES.—No. 4,694. Photographic printing-boxes. A. P. Keen.

STEREOSCOPIC CINEMATOGRAPHY.—No. 4,185. Apparatus for taking stereoscopic cinematograph photographs and projecting pictures on a screen. A. Wilson.

CINEMATOGRAPHY.—No. 4,788. Cinematograph apparatus. C. Farmborough.

CINEMATOGRAPH-PHONOGRAPH.—No. 4,842. Manufacture of sound records and synchronisation of same with cinematograph films. H. Knudsen.

CINEMATOGRAPH-PHONOGRAPH.—No. 4,851. Combined moving-picture and sound-reproducing apparatus. H. Knudsen.

CINEMATOGRAPHY.—No. 4,453. Cinematograph, etc., screens. R. H. Parkinson.

CINEMATOGRAPHY.—No. 4,714. Device for eliminating flicker in cinematograph apparatus. M. E. Richardson.

CINEMATOGRAPH-PHONOGRAPH.—No. 4,596. Means for synchronisation and reproduction of sound with cinematograph. W. Ross.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1s. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

COLOUR CINEMATOGRAPHY.—No. 145,478 (March 31, 1919). The invention is a process for the manufacture of a cinematograph film in colours which comprises the taking of negative images by a cinematograph camera laid on its side so as to give images with their horizontal lines parallel to the length of the film, the speed being twice the ordinary speed of, say, fifteen images per second in order to obtain two images through two coloured screens in the time usually occupied in taking a single ordinary image, or three times the ordinary speed of, say, fifteen images per second in order to obtain two images through two coloured screens in the time usually occupied in taking a single ordinary image or three times the ordinary speed in order to obtain two images and a blank. The increase in speed obtained by the inclusion of a speed-multiplying gearing in the camera. A positive is made from the negative by projection, the two films being arranged and moved relatively at 90 deg. the printing being effected in such a manner that the two images on the negative are together projected to produce on the positive film two side-by-side reduced images with their horizontal lines transverse of the film and which occupy the surface corresponding to an ordinary image.—Cesar Parolini, 3 Boulevard Carnot, Le Vesinet (Seine and Oise), Paris, and Gustave Perron, 9, Avenue Taillade, Paris. (Particulars of the process are given on another page in the "Colour Photography" Supplement.)

MULTI-PRINTING FRAMES.—No. 174,128 (September 18, 1920). The object of the invention is to provide apparatus adapted for use *inter alia* in producing multiple designs, images or impressions on plates, lithographic stones, etc., for the purpose of printing in one or more colours therefrom by any of the usual processes.

The apparatus includes a framework or carriage adapted to travel over a table supporting the sensitive surface and supporting an auxiliary carriage adapted to travel transversely of the main carriage so that the auxiliary carriage may be brought into a position directly above any part of a registering frame on the table. From the auxiliary carriage are suspended legs which can be lowered into contact with a thick covering sheet of plate glass laid on the negative in the frame on the sensitive surface

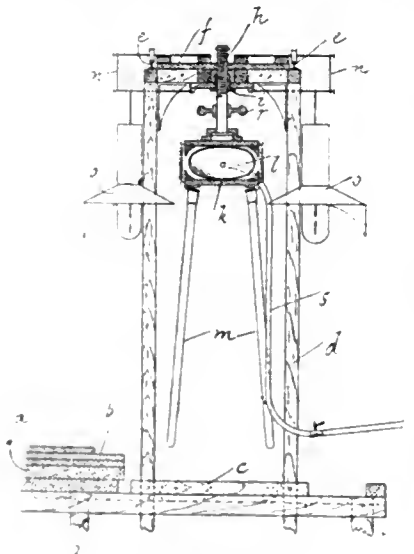


Fig. 1.

so as to hold the negatives rigidly in position. There is interposed between the freely hanging legs and the auxiliary carriage an inflatable member, on inflation of which the legs are forced by the pneumatic pressure against the covering plate glass. The

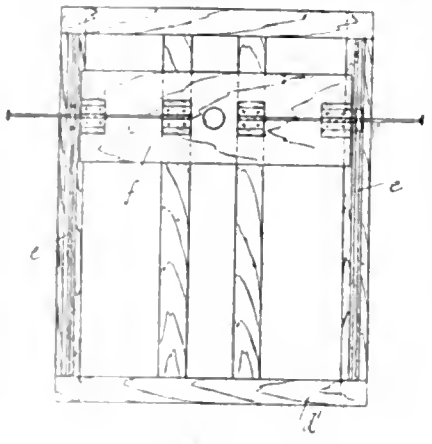


Fig. 2.

auxiliary carriage preferably carries also electric lamps for printing.

In the drawings, *a* is a table along two outside edges of which are arranged bars *b* bolted to the table supporting rails *b*¹ for

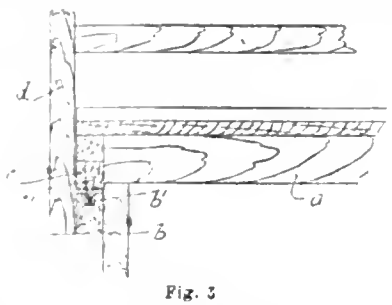


Fig. 3.

rollers *c* mounted in laterally extending bars *c*¹ of an upright carriage *d*, the bars *c*¹ tending to prevent the raising of the carriage from the table. On the upper surface *d*¹ of this carriage on rails *e* is mounted an auxiliary sliding carriage *f* in such manner that the auxiliary carriage may travel transversely of the

main carriage. Suspended from this auxiliary carriage by means of a screw threaded rod *h* engaging in a screw threaded bush *i* attached to the carriage is a separable spring-connected housing *k* containing an inflatable elastic vessel *l*, and from the lower portion of this housing are suspended depending legs *m*. From a framing *n* attached to the auxiliary carriage *f* are suspended electric lamps *o* which travel with the carriage.

On the table top a^1 is placed on a slate bed *p* on the sensitive surface a registering frame *q*, such as shown in figs. 4 to 7. This frame is fitted with slots (not shown) for subdividing bars q^1 formed with true right angles into which the negative from which the impression is to be made on the sensitive surface is inserted. On the top of the negative is placed a covering plate glass (not shown). The subdividing bars may be adjusted in position by inserting in different slots.

In using the apparatus the negative is inserted in its compartment in the registering frame and fixed therein by a strip of wood. The covering plate glass is laid thereon and the other

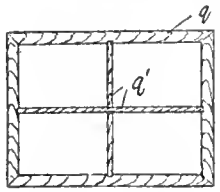


Fig. 4.

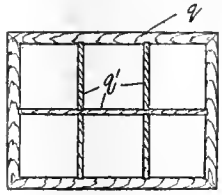


Fig. 5.

spaces not being utilised in the frame are covered to protect the sensitive surface beneath the frame. The carriages are now traversed until the depending legs are in position above the covering glass plate. By means of the wheel *r* the screw-threaded rod is turned until the legs bear on the covering glass plate, whereupon air is forced through the pipe *s* to the inflatable vessel and the depending legs caused to press more firmly on the covering plate glass. The electric lamps are switched on and the printing carried out. When the printing operation is completed air is allowed to escape, the wheel *r* is turned until the legs are clear of the covering glass plate, and the carriages moved along

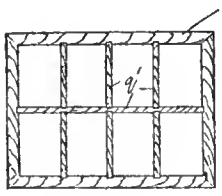


Fig. 6.

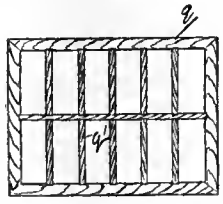


Fig. 7.

the table out of the way to permit access to the surfaces treated.

It will be understood that for multi-colour printing the different colours may be impressed in register on successive sensitised surfaces by using the same registering frame for each different colour so that they may be printed in register.—Henry Robert Eason, 38, Sylvan Road, Wanstead, London, E.11.

In a further patent, No. 174,309, of the same inventor, and having reference to the same type of apparatus, the claim is for a registering frame, applied to the sensitive surface and to receive negatives or positives, and formed with true right angles. Such frame is fitted with adjustable subdividing bars, also forming true right angles.

The following complete specifications are open to public inspection before acceptance :—

Cinematography. — No. 175,265. Cinematographic film strips. Pathé Cinema Anciens Etablissements Pathé Frères.

Cinematography.—No. 175,266. Storage reels for cinematograph films. Pathé Cinema Anciens Etablissements Pathé Frères.

Reproduction Device.—No. 175,284. Reproducing device for photographically recorded phonograms, especially tone films. J. Engl, H. Vogt and J. Massolle.

Dry-Plates.—No. 175,296. Photographic dry-platea. K. Wiebking.

Trade Names and Marks.

MARKS PLACED ON THE REGISTER.

The following marks have been placed on the register :—

Dupli-tized.—No. 420,051. All goods included in Class 39. Kodak, Ltd., Kodak House, Kingsway, London, W.C.2, dealers in photographic materials.

New Books.

Byepaths of Colour Photography. By "O. Reg." Edited by William Gamble. London: Percy Lund, Humphries and Co. 5s. net.

This is a very uncommon book, almost unique, we think, in the literature of colour photography or even of any branch of photography. For reasons which no doubt are desirable and sufficient, the author has chosen to issue his work under a pseudonym, but that which has been selected appears to be a deliberately thin disguise. Anybody who has no more than a superficial reading of the development of colour photography will quickly pierce it. However, as the author and editor desire to preserve the semi-anonymity we will respect their wishes.

The book is really a collection of thirty-six short papers, which we learn were written at different times and were intended for separate publication. The greater number relate to the history and technical design of the one-exposure three-colour camera, and more particularly to the optical methods for obtaining three identical images by the use of prisms, reflectors, etc., behind the one lens. We think it is fair criticism of this part of the book to say that the subject is illustrated rather than treated in such an exact way that the would-be constructor of a camera of this kind can apply the information without a good deal of experiment on his own part. Nevertheless, it is clear that these chapters embody the results of a very great deal of experimental work by the author, who, however, seems not to have the facility of making clear what are precisely the optical conditions which need to be fulfilled. We turned to Mr. Gamble's introduction in the hope that we should find there a more explicit statement of the conclusions to which the author has come, but in that we were disappointed. Nevertheless, experimenters with one-exposure cameras will find a very great deal in the book of profit to them in their studies.

From the historical standpoint we do not think the author is as well qualified by knowledge and temperament as he should be for such a task. For one thing he has a habit, which is very irritating to the historical student, of criticising inventions without naming their authors; and our confidence in his historical notes is rather disturbed by coming across such palpable, though minor, errors as these in the first paragraph on page 65, where it is stated that Dr. Vogel's discovery of orthochromatism originated from experiments on gelatine dry plates; or that on page 95 which refers to Farmer's mercury-iodide intensifier.

The later part of the book contains chapters on colour-sensitising, adjustment of plates and filters, exposure, and the making of three-colour prints and transparencies. Here again the author is evidently writing from the results of his own practical experience and brings forward hints and formulæ, some of which we cannot remember to have seen before. For example, he recommends the following variation of the Farmer reducer as free from tendency to eat away the half-tones of a negative. The negative is immersed for a few seconds in a mixture of 3 per cent. freshly made ferricyanide solution, 10 per cent. soda carbonate, 10 per cent. ammoninm nitrate, and 10 per cent. sodium chloride, after which it is rinsed and fixed in fresh hypo.

In conclusion, it is not possible to pass over without comment the strain of sarcasm or bitterness which characterises many passages. We are reminded of the mental atmosphere, partly querulous, partly self-satisfied, of that early work of Gissing's, "The Private Papers of Henry Ryecroft." Mr. Gamble, whose work of editorship, we strongly snspect, has largely amounted to re-writing, might well have exercised a mollifying influence in many places.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, MARCH 6.

Birmingham Phot. Art Club. Instructional Lecturettes.
Bradford P.S. Lantern Lecturettes by Members.
Forest Hill and Sydenham P.S. "Simple Picture Making." R. H. Lawton.
Glasgow and W. of Scot. Amat. P.A. "Autochromes." W. R. Baxter.
Kidderminster P.S. "With British Scouts in Switzerland." Lord Hampton
Leeds Camera Club. "Mounting and Trimming."
Southampton C.C. "Ruined British Castles." G. Embrey.
South London P.S. "A Ramble around Dorking." A. F. Redman.
Wallasey Amateur P.S. Original Photograms of the Year 1920.
Walthamstow P.S. "Through the Grecian Archipelago with a Pressman Reflex."

TUESDAY, MARCH 7.

R.P.S. Technical Meeting under the control of the Scientific and Technical Group. (1) Direct Photography as a fully efficient alternative and addition to our present system, by Howard Farmer; (2) Chart for finding the Depth of Focus with given aperture and distance of object for any photographic lens, by H. W. Lee, B.A. (Taylor, Taylor & Hobson, Ltd.); (3) The Carbonisation of Bromides (a simplified Ozobrome process), by Dr. W. E. Bradley.
Bournemouth C.C. Criticism Evening for Negatives and Prints.
Cambridge Phot. Club Address on the Annual Exhibition Edward Peake.
Dennistoun Amateur Phot. Assoc. Whist Drive.
Exeter Camera Club. Auction Jumble Sale.
Hackney P.S. "Practical Hints for Darkroom and Workroom" V. Jobling.
Leeds Photographic Society. "Pictorial Principles." H. A Crawford.
Morley Photographic Society. Whist Drive.
Nelson P.S. "Photography and its Relation to Education." E. H Reeve.
Rotherham P.S. "Shakespeare's Country." C. Robinson.
South Glasgow C.C. "Home Portraiture." Robt. Crerar.
South Shields P.S. "Amateur Photographer" Prize Slides, 1921.

WEDNESDAY, MARCH 8.

Accrington Camera Club. "Pictorial Analysis." W. H. Simcock.
Borough Poly. P.S. Fourth Lantern Slide Competition.
Catford C.C. "How a Reflex Camera is Made." W Butcher and Sons.
Croydon C.C. The Annual Rummage Sale
Dennistoun Amat. P.A. Moving Pictures in the Making.
Edinburgh P.S. "Colour Reproduction." J. W. Thomson
Ilford P.S. "Some further Anecdotes from Algeria" F G Newmarch.
Partick C.C. "Portraiture." Robert Crerar.
Photo-micrographic Soc. "The Edible Crab." E. A Robins.
Rochdale Amat. P.S. "X-Ray Photography." T. Eggles.
South Suburban P.S. "Camera and Cycle in West Kent." J. W Hodges.
Tyneside P.S. "Amateur Photographer" Lantern Slides.

THURSDAY, MARCH 9.

Camera Club, The. "Straight from the Shoulder." F. C. Tilney.
Gateshead C.C. "Amateur Photographer" Prize Slides.
Hammersmith Hampshire House P.S. "The History and Development of the Photographic Camera." Edgar Clifton.
Letchworth C.C. "Mounting the Print."
North Middlesex P.S. "Copying." W H. A. Fincham.
Optical Society. Ordinary Meeting.
Wimbledon C.C "Colour Photography (Paget Process)" M. W. Tutt.

FRIDAY, MARCH 10.

Wombwell P.S. "Rouen." J. R Wigfull.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, February 28, the president, Dr. G. H. Rodman, in the chair.

The President declared open an exhibition of prints selected from the Annual Print Competition It will be open during the coming month, and will well repay a visit. He then called upon Mr. Thomas Bell, F.R.P.S., to deliver his lecture, entitled "Present Day Portraiture."

Mr. Bell open his lecture with a short talk on the position of portraiture to-day as compared with the time of D. O. Hill, remarking that although there had been vast improvements in the portrait studio, we have to go back to the style of D. O. Hill to produce real artistic photographs. He pointed out that since his time we had gone through definite pictorial stages, namely, small, full and three-quarter length figures, cabinets with marble hall backgrounds and the present plain setting. Next he referred to the so-called Rembrandt lighting, the fuzzy gum bichromate print and the most martistic sketch portrait. Any man can work a camera, said Mr. Bell, but it takes an artist to portray character. This is a thing which cannot be taught but is a gift. He said he was glad to see retouching was gradually being diminished, with the result that faces did not appear to be boiled and inflated with a bicycle pump. Good photography and bad drawing do not blend, the same may be said of sketch portraits and backgrounds worked in on the negative. He expressed pleasure in the fact that we were working back to plain, straightforward lighting, and that people realised the beauty in cast shadows. In the dull lighting which has been the fashion recently the pupils of the eye dilate, producing a ghastly stare. Posing has become natural, and lost the stiff wooden appearance produced by stock poses. He regretted the cutting out of the hands in present-day portraiture, also stating that in his opinion the best photographers of to-day are beating the living painters in posing, having so many more opportunities with different sitters. He recommended the study of Raeburn for suiting the style of lighting to the subject. For instance, his portraits of men had a strong and definite light, for women the outlines were not as clearly defined, and for children the lighting is beautifully soft.

Mr. Bell then showed a very fine collection of slides of prints by British and foreign workers. In the discussion which followed he stated that a long exposure gave the best results, as the expression varied, whereas Dr. Rodman said in opposition that the fine results of Mr. Walter Thomas were obtained by means of a reflex camera, focal-plane shutter and flashlight.

A hearty vote of thanks was accorded to Mr. Bell in the usual manner, and thus ended a very pleasant and instructive evening.

CROYDON CAMERA CLUB.

Mr W Bullock, hailing from the Willesden Photographic Society, gave a very interesting exposition, entitled "Picture Making with the Camera." Being an artist with the brush before he took up photography as a means of pictorial expression, added value to a well-reasoned preliminary paper which supported the cause of "control." The modest lecturer, however, is by no means a militant extremist, and by medium mixers of the super type might be regarded as unsound, as admissions were made that the ethics of some particular procedures were open to debate.

Apart from inculcating art maxims which continually embellish photographic discussions in varied phraseology, but essentially are the same the lecture was of real utility in showing what can be done in dressing up an indifferent bromide print to exhibition standard Mainly, this is effected by modification, without material alteration, of the high lights and shadows, combined with excursions of a more questionable nature.

For picking out high-lights he employs a small brush charged with weak ferricyanide reducer, testing its action on waste prints or trial strip exposures The bromide paper must be just surface-dry, and the brush set in quill, not metal, which latter had afforded some remarkable effects in Prussian-blue. For large areas, cotton-wool is substituted for the brush.

Shadows are strengthened by Vandyke-brown and Payne's-grey tube oil-colours mixed in right proportions and thinned with spirits of turpentine and negatol This is applied with a sable-brush where required, and when the paint is nearly set, smoothed by gently dabbing with a small ball of cotton-wool. For graded tints over big spaces, such as sky, blacklead is employed, though it does not always match in colour, but employed as the first step to the finished article this does not matter.

For exhibition work he first makes a bromide enlargement, taking care no actual white or black is present. This is worked upon in manner described with other additions shortly to be mentioned. The composite picture is copied in the camera on a small plate, from which another enlargement is made and toned up to concert pitch.

Without suggesting that this procedure will not result in a loss of "quality" with certain classes of subject and type of negative, Mr. Bullock amply demonstrated that for much exhibition work loss of quality if any is negligible, and improvement in other directions considerable. He copies out-of-doors, inclining copy and

camera towards the sky in a soft light towards the evening, and employs Imperial "fine grain" ordinary plates, which, he said, are admirably adapted for the purpose, possessing, as they do, great latitude.

Originally he made the first enlargement on a large scale, with the idea that the bigger the print the less the hand work would show, but had found this to be unnecessary, and now adopts about one standard size larger than the final print. In both cases "ordinary" surface bromide papers are preferred.

At home he is the proud possessor of a veritable Madame Tussaud's collection stored in negatives all ready for introduction into pictures, which, whenever possible, are taken without any human element entering. Life is too short for combination printing, and a far simpler plan is adopted. A suitable figure is selected, enlarged to the right size on thin bromide paper, and when dry cut out with a sharp knife held so as to afford a slight bevel inwards, the back being smoothed down a trifle at the edges with the knife. The figure is stuck on the print, and, with care, no junction shows. If it does, a little work on the copy negative, and enlarged print therefrom, will remedy matters.

Another display of virtuosity consisted in replacing a distant view as seen through an arch at Gruyère (the place where the holes come from) with another of desirable character. The arch was cut out and stuck down on the view, and considerable pressure applied. This elegant feat interested the purists immensely, and, under more pressure, the lecturer admitted that purer forms of photography were known.

The discussion was prolonged, and up to best traditions in the lurid line. It can only be glimpsed at. Mr. Harpur was with the lecturer tooth and nail concerning the ferricyanide reducer, but reproved him for minimising the quality of the original negative. "Dash the negative!" exclaimed the naughty Mr. Jobling, overcome by the spirit of the evening. "Quality is of the utmost importance," firmly insisted the prior speaker. "Who is talking about *photographic* quality to-night?" inquired the utterly bewildered Mr. Coffin, in the innocence of his heart.

Mr. Sellors, temporarily forgetting his own bromoil sins and nigger minstrel business with bromide prints, prophesied a slough of moral degradation setting in, thanks to the lecturer's efforts on that behalf. The paste-on advocacy was painful in the extreme. A far better plan was a method suggested by Mr. G. E. Brown in an editorial in the "B.J." The bromide print and cut-out figure are adjusted to each other under water, squeegeed on to glass, and copied. How this method frees itself from the charge of immorality Mr. Sellors did not explain.

Mr. Salt congratulated the lecturer on having so ably demolished the title adopted by him, and then proceeded to go for everybody all round, the "tooth-and-nail" partner particularly. He was amply rewarded by drawing from Mr. Harpur the remarkable dictum that "art training comes quite naturally to the photographic pictorialist." Which accounts for a lot.

A most hearty vote of thanks was accorded Mr. Bullock, whose happy style of lecturing and pleasing personality contributed not a little to a highly successful evening.

THE NATURE PHOTOGRAPHIC SOCIETY.

The annual general meeting was held at the Royal Photographic Society's House, Russell Square, London, on February 25, 1922. The President, Mr. E. J. Bedford, occupied the chair. The report of Council and treasurer's financial statement were adopted, and showed the Society to be in a very satisfactory position. The officers for the ensuing year were elected as follows:—President, Hugh Main, B.Sc., F.Z.S., F.E.S.; vice-presidents, C. Edwards, Dr. S. Hastings, H. Irving, C. Kirk, J. J. Ward, W. M. Webb; committee, T. M. Blackman, W. H. S. Cheavin, R. Chislett, C. W. Colthrup, S. Crook, A. W. Dennis, R. Fortune, G. C. S, Ingram, C. J. King, W. H. Pratt, H. M. Salmon, A. E. Tonge; hon, treasurer, Hugh Main; hon. secretary, E. J. Bedford.

At the conclusion of the business meeting tea was served, followed by an open meeting for the exhibition of lantern slides. A large number, including natural colour slides, were passed through the lantern. In the evening a dinner took place at the "Florence" Restaurant, Rupert Street, W., Dr. G. H. Redman in the chair, and a flashlight photograph of the company present was taken during the evening.

THE CAMERA CLUB.

Mr. Arthur C. Banfield, on Monday evening last, read a paper on the Bromoil process, in which he put forward his views and experiences with a vigour and clearness which one expects from a technician of his calibre, and expert not only in his every-day profession of studio portraiture, but in mechanical and experimental work of many kinds. He boldly espoused the Bromoil process in declaring that if properly used and not abused it is one of the most beautiful processes which photographic science has given us. It depended upon the capacity of a moistened surface to absorb or repel a greasy ink as in lithography. A bromide print, which had been treated in a copper bleaching bath containing chromium, had its gelatine tanned in proportion to the amount of silver in the image, and, therefore, when a suitable ink was applied the original silver image could be built up again, if necessary, in absolute facsimile. But it was necessary that a reasonably perfect negative and a reasonably perfect print from it should be made. Mr. Banfield scouted what he thought was a common opinion, namely, if one had a "rotten" print, the best thing to do was to Bromoil it. Whatever developer was used, development should be fully carried out. A print or enlargement which had been over-exposed and the development of which had been stopped to prevent too great a density was useless for the process. He did not attempt to deal with the bewildering variety of bleaching formulæ. One which he had used exclusively for the past two years was:—

Copper sulphate	8 ozs.
Potass bromide	8 ozs.
Potass bichromate	200 grs.
Sulphuric acid	160 minims.
Water	100 ozs.

In making this stock solution the acid is first added to the water. His working bath was made by mixing 1 part of the stock solution with 5 parts of water, and bleached a print thoroughly in about 3 minutes. Used bleacher could be employed again by adding more stock solution to it so that its bleaching speed was maintained at the 3 minutes standard He found that the bleacher seemed to improve with age.

Prints were fixed after bleaching, and the washing before fixation required to be very thorough. for at least an hour in running water. Incomplete washing at this stage infallibly caused blotches and markings which could not be dodged in afterwards working-up. Mr. Banfield was strongly of the view that it was much better to bleach immediately after developing; there was a considerable saving of time, with a much smaller chance of getting stains. Each print, as soon as fully developed, was placed in a dish in running water, and the accumulated batch then washed for about a quarter of an hour. They could then be handled with safety by artificial light, bleached, fixed, and finally again washed for a quarter of an hour in a dozen changes of water before being hung up to dry The fixing bath should be 3 ozs. of hypo in 20 ozs. of water, in which the bleached print was turned over for 10 minutes. This method left no silver in the paper, so that the image was formed by a permanent ink on which any traces of hypo were without effect.

Mr. Banfield laid stress on safeguarding the gelatine surface from scratches, folds, kinks, or blisters. It was folly to hang prints over a line to dry. Also prints should be carefully freed from adhering globules of water by blotting off before drying. The best method of drying was to pin one corner of each print to the edge of a table or shelf so that the print hung freely suspended.

As regards the tools for pigmenting, Mr. Banfield again declared himself in favour of somewhat exceptional practice. The genuine fitch brushes were too expensive, and, moreover, were very liable to clog and to shed their hairs. He had found a serviceable alternative in the hog-hair brush, which was very cheap, a No. 4 of large size costing only 12s. 6d. and sufficing to ink up an 18 x 15 print in half an hour. Also the work kept beautifully clean, and the only disadvantage was the rather coarse grain. For large prints the open hog-hair grain was agreeable rather than otherwise, but for prints smaller than, say. 12 x 10, any coarseness could be easily removed by gently going over with a small dry fitch brush. The final effect was as if a fitch had been used throughout, except that there were no broken or strayed hair on the print.

For keeping the print moist during pigmenting he used a dozen

or so sheets of Fotonic or Robosal blotting paper, soaked in water and laid in a pile on a piece of slate. With a rolling pin as much as possible of the water was squeezed out. In summer it might be necessary to use the pad in a fully soaked condition, in which case a safe edge was provided under and along the edges of the print by laying down strips of old roll film (after removing the gelatine coatings) on the pad so as to overlap the print on each of the four sides by about half an inch.

The most important point of all was the soaking of the print before pigmenting. The key to this much discussed part of the process was that pigmenting was governed entirely by the amount of water which the print contained. The less water, the harder the ink must be, and *vice versa*. He found that the best practice was to soak for a minimum period at a constant temperature, e.g., 65 deg. F. After about three minutes the print would lie quite flat in the water, then holding the minimum amount of water With a very hard ink, the print was then in the best condition for pigmenting, and also the gelatine was in a better (harder) condition than if more soaked

In seeking to get over the troubles of pigmenting he had persuaded a friend to make for him a series of inks of two degrees of consistency, one extremely hard and the other very soft. By judicious use of these inks it was easy to suit the hardness of the ink to the amount of water held in the gelatine of the print.

Mr. Banfield described in detail his own practice in pigmenting A little hard ink was spread out thin on one corner of the palette, and a little of the soft ink on another corner. The hard ink was touched and worked out thin with a hog-hair brush, and then the print, after three minutes or so soaking at 65 deg. F., until it lay flat was put on the pad and free moisture removed with fuffless blotting paper The image should appear as a delicate matt when observed at a sharp angle. The brush charged with the hard ink was then applied firmly, when the image should appear very quickly and complete in all details at each stroke of the brush. This required a peculiar brush action only learnt by experience. It was difficult to describe, but the brush is held lightly, with the handle leaning in a forward direction, and is applied with a quick firm stroke, not exactly a dabbing action, but a quick firm pressure combined with a slight dragging action

If the paper, through having too soft a gelatine coating and therefore containing too much water for the hard ink, does not take the latter properly, the condition is evident at the first stroke of the brush, and the ink must then be softened, the brush is then very lightly applied to the patch of soft ink and then worked down on to the patch of hard ink already described. Only a minute incorporation of soft ink is required materially to affect the working. Mr. Banfield said little about methods of control in pigmenting, and in fact uttered the caution that excesses in this direction tend to cover a beautiful process with ridicule. A small still flat hog-hair brush was of great effect in touching, or even making, high-lights, but needed to be used sparingly. In portrait work it served for hatching a background. The brush required to be wiped after each stroke, or it would cause smudges. Vignetting could be done with a small sponge on the end of a glass tube, moistened with a mixture of petrol and water. Light accents might be put in on the dry print with soft rubber if broad, and with hard rubber if sharp, but such methods were easily abused.

In conclusion, Mr. Banfield referred to the extraordinary time sometimes required to dry a Bromoil print completely. Sometimes it required three months under ordinary atmospheric conditions. He had constucted a low temperature oven in which prints were held vertical at a temperature of about 100 deg. F. They dried within at most three days so completely that they could be dry-mounted without risk.

A VISIT FROM MR. J. J. ROUSE.—On Friday last we had the pleasure of a call from Mr. J. J. Rouse, Managing Director of Messrs. Kodak (Australasia) Proprietary, Ltd., who has been paying a short visit to this country, coming by way of the United States of America, and in the course of conversation we learned that he was one of the favoured few representatives from the Overseas Dominions who had the honour to receive an invitation to attend the wedding ceremony of H.R.H. Princess Mary on Tuesday last. By the time this note appears Mr. Rouse will be on his way back to Australia, viâ Paris and Marseilles.

News and Notes.

THE OPTICAL SOCIETY.—The next meeting of the Society will be held at the Imperial College of Science and Technology, South Kensington, at 7.30 p.m., on Thursday, March 9, 1922, when the following communications will be presented and discussed: "A Criticism of the Nodal Slide as an Aid in Testing Photographic Lenses." By T. Smith, M.A., F.Inst.P., and J. S. Anderson, M.A., D.Sc., Ph.D., F.Inst.P. "A Non-Polarising Spectrophotometer." By A. J. Bull, M.Sc., F.Inst.P. "The Photometry of Optical Instruments." By J. Guild, A.R.C.Sc., F.R.A.S., F.Inst.P. "A Projective Treatment of the Submarine Periscope." By T. Smith, M.A., F.Inst.P. "Some Measurements of the Stresses Produced at the Surfaces of Glass by Grinding with Loose Abrasives." By A. J. Dalladay, A.Inst.P.

KODAK DEMONSTRATIONS TO PROFESSIONALS.—Visitors to Messrs. Kodak's Liverpool depôt on Monday evening, February 20, were well rewarded with a capital demonstration by Mr. Lawrence. The large Church Street shop had been prepared for the evening, having the counter moved back, additions to the seating accommodation, and the installation of studio and dark-room necessities. The evening opened with a dissertation on the salient points of films this being followed up by the making of a number of film negatives. A couple of shielded and diffused ½-watt lamps supplied the light for the portraits, very keen interest being displayed in a spot-light lamp which the demonstrator used for additional effect. Brought into play on the shadow side of the face, the spot light gave a very noticeable addition of "live appearance" to some of the pictures. In one case, though, it appeared to approach opposition to the main lighting, thus neutralising somewhat the truth of delineation as given by a single light source. But, as Mr. Lawrence explained, spot lighting is a new thing, at present in the experimental stage. It was evident, however, that very effective results are to be got by its use and judicious control. A point worth notice is that better results seem to be got by a condensed or focussed beam than could be obtained with any kind of diffused or reflected light. The evening finished with the making of some prints on etching brown, and the ease with which these were done —under parlour conditions—was a convincing proof that there is nothing for anyone to be afraid of in this new and high-class paper. The demonstration was well attended, the available space being comfortably filled with Liverpool and other Lancashire photographers, and a welcome surprise was accorded the audience by a speech by the President of the Lancashire Master Photographers on the Society and its future aims and ambitions. Mr. Winter also added to the evening's success by posing for some of the pictures.

BRITISH INDUSTRIES FAIR.—The Eighth Annual British Industries Fair, under the Department of Overseas Trade, opened last Monday at the White City, Shepherd's Bush, London, W.12, and remains open until March 10. The industries represented here, apart from those at the Birmingham Fair, held concurrently, include paper and stationery, leather and fancy goods, toys and games, silver and electroplate, scientific and optical instruments, photographic and musical instruments, glass and china ware, etc., etc., and unusual efforts have been made by the organisers to ensure a large attendance of buyers. In all 48,000 invitations have been sent out to overseas buyers, and advertisements have also been inserted in foreign and overseas trade and daily journals. A new departure has also been made by our own post office in the fact that all outgoing mails have included in the cancellation stamp the words "Visit the British Industries Fair, 1922, February 27 to March 10," which is now familiar on inland letters. The number of exhibitors (1,400) this year is slightly less than last year, but the total space occupied is the same. Photography is not so well represented this year as one would wish to see it: the allied industries, however, are well to the fore, particularly cinematography. The well-known firms of Butcher, Dallmeyer, Ross, and Sinclair have very attractive exhibits of cameras, lenses, and lanterns, mainly cinematographic. Johnson & Sons Ltd., and Burroughs Wellcome & Co., exhibit their well-known chemicals, developers, etc.; the Westminster Engineering Co., Ltd., arc lamps and other specialties; and Ellis Grafer has on view an attractive selection of photographic enlarging, developing and other machinery. Photo-

graphic albums and frames there are galore by many firms in the stationery section, and an exhibit attracting considerable attention is that of E. B. Fry, Ltd., who have a special show of passe-partout materials, including a gauge for putting on binders—a distinct novelty, also a cleverly-designed printing box for films, and a new variety of celluloid masks. A truly wonderful exhibition when one realises that no exhibitor may exhibit articles other than those of his own—and of British—manufacture.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

IMPROVING CAMERA CASES.

To the Editors.

Gentlemen,—All the camera cases I have seen—even the more expensive hide—are lacking in one respect. They are not fitted with studs on the bottom corners such as are found on the cheapest suit case.

A useful little tip is : Procure two pairs of ladies' rubber revolving heels, and four bifurcated rivets about 1 or 1½ in. long, drill a hole in each corner and attach the rubbers, and finish by flattening down the rivet ends inside ; a washer is not necessary. Not only does this fitting prevent wear, but it keeps the case dry and clean in wet weather. There are four (costing 1d. each) on my case, and they have been there since 1911.

T. P. MacNally.

Tuam, Co. Galway.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

B. H.—(1) The best process for chocolate tones on bromide prints is the uranium toner, but it requires more than ordinary care in use, and even with the best attention is liable to give results which are not very permanent. Varnishing the prints with ordinary celluloid varnish is a very great means of improving permanency. (2) About the best imitation of P.O.P. is obtained by the hypo-alum bath.

C. H.—The little book, "Commercial Photography," issued by our publishers, contains quite a few hints on the photography of engineering subjects. So far as we know, there is not any other work on this subject except an American one, "The Commercial Photographer," by L. G. Rose, published by F. V. Chambers, 636, Franklin Square, Philadelphia, Pa., U.S.A., price $4. This is a very much larger and an excellent work.

M. P. T.—All processes of restoring a faded print are very risky, and it is quite possible to make the print worse than it is. A P.O.P. toning bath would not help matters. By far the best thing that you can do is to have a reproduced print made by a firm of experience in such work. Such a firm is Messrs. Jeffery and Boarder, 55-56, Mattock Lane, West Ealing, London, W.13, who, to our personal knowledge, are most successful in this specialty.

S. A. T.—You will do no good by raising your roof unless you raise the floor to a corresponding extent. Rolled (ribbed) plate glass would soften the light, but would not change its direction. Perhaps the best arrangement would be to instal a large cheval glass, about 40 × 30 inches, to serve as a side light. We have seen this used very effectively in a top-lighted studio. You could probably borrow such a glass from a tailor or dressmaker to make an experiment with.

J. R. S. —If you used the oil colours specially made by Winsor and Newton, 37-40, Rathbone Place, London, W.1, for transparency work you could easily get results as good as, or better than, the sample you send, and which arrived cracked. The sample, however, is evidently coloured with dyes, which are quite good enough for the purpose of advertisement transparencies. You should try the sets made up for this purpose by Johnson and Sons, 23, Cross Street, Finsbury, London, E.C.2, or the Vanguard Manufacturing Co., Maidenhead.

L. E. A.—We are afraid it is not possible to discover a reason for the difference in tone from the particulars stated. Generally a great secret in getting uniform results by hypo-alum consists in having a large quantity of ripened bath in use, say not less than 4 or 5 gallons, strengthening this bath by moderate additions of freshly-prepared hypo-alum mixture as prints are toned in it. Another point is equal heating of the bath. The vessel containing the hypo-alum mixture should preferably not be heated directly by a gas ring, but be placed in a larger tank containing water kept at the required heat to produce a temperature of 120 deg. F. in the toning solution.

T. P. E.—The development of the cinema film was so gradual that it would require almost a short treatise to answer your questions, which, in fact, cannot be answered in the specific form in which you put them. If one defines the "invention" of the cinema film as a commercial introduction, then the year 1895 is the date, in which year MM. Lumière first made the cinematograph a practicable thing by the invention of an efficient projector. Really you should take the opportunity of looking at chapter 3 of "Living Pictures," by Hopwood and Foster, for an answer to your questions. You can see this book in the Library of the Patent Office, 25, Southampton Buildings, Chancery Lane, W.C.2.

C. G. B.—Assuming that the maximum dimension of the film picture is 1 inch, and that the available distance of 1 foot is the distance from the film to the screen, the focal length of projection lens required for a projected image 18 × 18 inches is 0.6 inch. We do not know that such a lens is obtainable, and do not think it is. We suggest that you write to Messrs. Taylor, Taylor and Hobson, who have recently been specialising in cinematograph projection lenses. If they cannot supply, they can perhaps refer you to makers of microscope lenses suitable for your purpose, although we fear the optical difficulties of definition and illumination are somewhat serious. As regards using a longer focus, you could perhaps get a 1-inch lens, the use of which under the conditions specified above would give you a picture 10 × 10 inches.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3227. Vol. LXIX. FRIDAY, MARCH 10, 1922. Price Fourpence.

Contents.

SUMMARY.

Many useful hints on manners, dress, the getting of orders, and others matters of particular interest to receptionists are dealt with on page 140.

In a leading article we deal with the status of the professional photographer, who, as we point out, should imbue his mind with the settled conviction that he belongs to a worthy profession, the dignity and credit of which he is bound to maintain and to augment in every possible way. (P. 134.)

A chart for finding the depth of focus, with given aperture and distance of object, for any photographic lens, is illustrated and described in a communication from Mr. H. W. Lee, B.A. (P. 135.)

A simply constructed apparatus for measuring the focal length of the lens by what is known as the Clay method is the subject of an article on page 137.

Although acid fixing baths for bromide papers are commonly recommended in preference to plain hypo solutions, the latter have certain advantages which it is advisable not to overlook. (P. 133.)

Many contradictory and erroneous statements have appeared in the lay Press concerning the making of the exposures in Westminster Abbey on the occasion of the Royal wedding. On page 141 will be found details of how the fortunate operators really did accomplish the task.

The use of an optical enlarging apparatus in a modern lithographic establishment where poster and large work is executed is described in an illustrated note on page 141.

A very slight trace of hypo in a persulphate bath is sufficient to prevent or delay its reducing action. (P. 134.)

Many excellent portraits and landscape prints, the work of Mr. Arthur C. Banfield, are now on view at the Camera Club. (P. 142.)

At home portraits are often too contrasty. It is advisable always to use backed plates or films, to screen the lens, and to expose fully. (P. 134.)

The greatest caution is necessary when attempting to loosen a stuck lens cell. On page 133 will be found particulars of a simple device for, and method of, doing the work in the safest manner.

A non-actinic hand-lamp is a useful thing to have in a badly illuminated dark-room. A pocket electric torch may be made to serve. (P. 143.)

Photographic trade in Java, Leuco-bases in colour photography, and several other subjects are dealt with by correspondents in our "Correspondence" columns. (P. 146.)

Mr. W. L. F. Wastell, F.R.P.S., is to be the new president of the Royal Photographic Society. (P. 145.)

Stereoscopic cinematography is again the subject of a patent (P. 143.)

EX CATHEDRA.

Stuck Lens Cells. The detachment of one or other of the separate cells of a doublet lens, which has been allowed to get into this condition through careless keeping or has been bought as such, is often not the easiest operation, owing to the difficulty of getting a strong grip of the small projecting surface. A method of dealing with these obstinate cases which, we think, originated from one of the mechanical geniuses included within the membership of the Croydon Camera Club, is to cut a piece of wood of about one-quarter inch thickness, of width about twice the diameter of the cell to be removed, and of length about four times this diameter. A little way from one end of the piece of wood a circular hole, of diameter a shade larger than the outside diameter of the cell, is cut with a fret-saw. The hole should be of such size that the cell can be just slipped tightly within it. Then, by means of two cuts with a saw a strip of wood about half an inch in width is cut away so as to leave an open space between the circular hole and the further end of the piece of wood. When thus completed, the appliance somewhat resembles the "button stick" largely sold during the war for slipping under the button of a soldier's tunic as a protection of the latter whilst the former was being polished. If now the lens cell be inserted in the circular aperture in the wood and the two separated ends of the piece strongly gripped in the hand, the cell is most firmly held and can be readily unscrewed.

* * *

Fixing Baths for Bromides. Fixing baths made up according to one or other of the "acid" formulæ have become so universally popular that it seems frequently to be taken for granted that a bath of this kind is the necessary practice in the making of bromide prints. Such, however, is not the case; and indeed it may be said that for more than one reason a plain solution of hypo is to be preferred to any acid fixing bath for the fixation of bromide prints. One reason is that hypo, when used by itself, without the addition of alum, sulphite, or any of the usual components of an acid bath, goes further so far as fixing is concerned. It is sometimes urged in favour of the acid type of bath that it does not become stained in use, and for that reason can be employed for a larger number of prints. But we believe that this is a fallacious argument, and that the use of an acid bath is one of the most common causes of incomplete fixation of prints on development papers. The bath keeps practically free from colour until it is exhausted, or at any rate has reached such a stage of exhaustion that fixing takes place very much more slowly. On the other hand, a plain hypo solution, from the fact that it becomes gradually darker in colour as prints are fixed in it, gives, so to speak, a warning signal that it is reaching a stage when it has done its work and requires renewing

Home Portraits. Many workers in this interesting branch are disappointed with their results, finding them hard; that is to say, lacking in detail in both high-lights and deep shadows. In such cases it is usual to blame the lighting, but it is quite wrong to do so. If the lighting appeared agreeable to the eye there should be little difficulty in rendering it correctly on the plate, and as a rule failures to do so are due to under-exposure. With plates and films of the rapidity now available there is no excuse for under-timed pictures if a lens of reasonably large aperture be used and development not carried too far. It is almost imperative that backed plates or films be used, as few unbacked plates will stand the necessary exposure without a loss of detail in the high-lights. Another precaution which is neeessary when working against the light is to screen the lens so that no light, except that coming from the sitter, enters the lens. This is easily accomplished by suspending in front of the lens, by any convenient means, a large dark card with a cut-out opening, at such a distance that it just fails to obscure the edges of the plate. It is suggested that for a trial two exposures should be made, one three times as long as the other, and the results compared. This will afford much information for future work.

* * *

Finding in the Dark-Room. One of the great advantages of the ceiling form of light in the dark-room is the facility with which things can be found in parts of the room outside the range of the direct illumination from a lamp placed on the working bench. The gloom in which most of the space of a room is enveloped when this latter form of lamp is the only one employed is replaced by a degree of visibility quite sufficient for finding anything in the room, such as boxes of plates, or bottles on shelving, while at the same time there is no risk of fogging plates which may be in course of development. Those who do not care to go to the trouble of fixing a ceiling lamp have a very good substitute in an ordinary carbon filament electric bulb mounted in one of the usual holders which in turn is attached to a convenient handle. To the handle is fixed any convenient container of the lamp—light-tight, except that the front open end is covered with yellow or orange fabric. Supplied with current by a few yards of flexible cable, a non-actinic hand-lamp of this kind serves for discovering anything which may be sought in the dark-room without interference with other operations. Even those who have not the convenience of electric supply may obtain the same facility by making use of one of the cylinder forms of pocket electric torch after fitting a disc of yellow or orange glass behind the bull's eye with which these torches are usually fitted.

* * *

Reduction with Persulphate. There are still many people who find it difficult to make the persulphate reducer work evenly. There are several reasons for this, the principal one being a desire to hasten the process by acidifying the solution too strongly. If this be done to excess there is a tendency to patchiness all over the film, with the result of practically ruining the image. Any good sample of persulphate will reduce without the addition of acid, and in such cases the result will almost certainly be satisfactory, although the process may be rather lengthy. If no action be observed in fifteen minutes a trace of sulphuric acid may be added, care being taken that it is thoroughly diffused through the solution and the dish well rocked for a minute or two. If the negatives have been fixed in an acid fixer or a hardening bath has been used reduction will take considerably longer. It will also be found that very rapid plates take much longer to reduce than slow ones, the length of time taken to develop being practically an index to the proportional time necessary for reduction. A very slight trace of hypo is sufficient to delay or prevent reduction, by decomposing the persulphate, so that if this be suspected the solution should be discarded, and a fresh one made, which will usually work satisfactorily. Dark patches at the edges or corners are usually due to handling the plates with hypo-contaminated fingers.

IMPROVING THE PHOTOGRAPHER'S STATUS.

DURING the present period of industrial and commercial depression the photographer may usefully take stock, not only of pecuniary profit or loss, but of the less directly felt, though in the end sometimes more important, question of status. Amid many unpromising signs, gleams of hope begin to be discerned. Chief of these is a growing interest in this subject among photographers themselves. There is much truth in the assertion of psychologists that both bodily and mental well-being are largely conditioned by the patient's own impressions, and this is even more applicable as a maxim for business and professional prosperity. "Think success and you will be successful," was the advice given recently by the originally poor founder of a now colossal stores; and this is but a variant of the new auto-suggestive incantation, "Every day, in every respect, I am getting better and better." Now, matters of prestige and status are precisely of that semi-intangible kind capable of being influenced, for good or ill, by the worker's own mental attitude. To a great extent, what he thinks of himself will give the cue to what others think of him. As Mr. Bernard Shaw has said, the best way to effect great changes is to act as if they were already made.

To begin with, then, the photographer must imbue his mind with the settled conviction that he belongs to a worthy profession, the dignity and credit of which he is bound to maintain and to augment in every possible way. He should decline to be slighted or treated in a manner inconsistent with that ideal, or to undertake any work derogatory to it. The tale is told of a well-known West End worker, who happened to call on a would-be lady of fashion to make some suggestions relating to a large portrait in carbon which had been commissioned. She received him in the drawing-room somewhat ungraciously, remarking, "I think there is a tradesman's entrance." To which he replied, "I see you do not recollect me, madam. I am the photographer." Few, on the spur of the moment, could have made answer so effectively, yet—as it turned out—so inoffensively.

It is distinctly a gain that greater stress is now being laid on the scientific aspects of photography, and that these are approached in a more exact, orderly and methodical way than was at one time the case. The claims of the camera craft as a science are stronger than its title to rank as an art, or, rather, are easier to drive into the average person's unimaginative mind. Photography has long been called the handmaid of science, but this is a grave under-statement. It is but bare justice to assert that many of to-day's chief scientific advances are mainly, if not solely, due to photographic aid.

As regards portraiture, there is no doubt the general level is rising. The unfortunate incompetent, who opened a studio simply because he was a failure at everything else, has been decimated by the war and its aftermath.

Public taste is better also, and the more extensive display of good-class specimens renders rivalry hopeless, save by those who can produce results reasonably equivalent. This, indeed, is one excellent method of assuring the photographer's status, to see that bad work is everywhere drowned by its opposite.

A much-disputed point is the relative advantage of a doorway or a shop-window. Some of the best and most select workers prefer the former, which unquestionably looks more professional and less tradesman-like if properly handled. But it must be a handsome doorway, smartly and effectively decorated, yet with a refined taste; while the shop, if any, that happens to be adjacent, ought not to be allowed to overshadow it. A photographer's doorway should not look like the barely tolerated poor relation of a well-to-do shop. Again, it is a help to insist on the word "Studio." This should be inscribed above the door, or shown on a plate in conspicuous letters, preferably preceded by the photographer's name, to give a personal, and therefore more professional, touch.

From the standpoint of status, outdoor work is a stumbling block. In these hard times it would, of course, be the height of folly to refuse it, or even not to seek it. Many photographers, however, consider that it has a rather detrimental effect on a portrait studio, and take care to keep it as inconspicuous as possible, by choosing the quietest hour, relegating the actual exposure to assistants or trade workers, and never exhibiting samples, unless inside.

Though some will differ, it is more conducive to dignity to keep aloof from merely sectional societies or bodies, whether political or social, except those one takes a genuine interest in. The "local bounder" type of man, who belongs to everything, no matter how mutually antagonistic or contradictory, and is the bosom friend of everybody, begins to be distrusted and out-of-date. As Mr. Pirie Macdonald piquantly put it a little while ago: "You have got to be awfully careful about deceiving the dog."

In conclusion, a discreet *esprit de corps* should be cultivated. It is folly to criticise other photographers or their work before sitters, or to attempt cutting them out. It always recoils. One never finds a doctor doing that kind of thing. And, on occasion, when there is something vital to be gained, or fought against, the doctors show an impressive unanimity and act *en masse*. Photographers must learn to speak and act with equal unity. When they do, they will be accepted at their own valuation.

CHART FOR FINDING THE DEPTH OF FOCUS, WITH GIVEN APERTURE AND DISTANCE OF OBJECT, FOR ANY PHOTOGRAPHIC LENS.

(A Communication from Taylor, Taylor & Hobson, Ltd., Leicester and London.)

In constructing a method for finding the depth of field for any set of conditions, it is necessary to settle first what shall be the standard of definition. A usual condition for hand camera lenses of 5 or 6-in. focus is that the circle of confusion shall not be greater than 1/100 in. If now, a photograph with this degree of diffusion is enlarged to double its size, there will be an amount of diffusion 1/50 in., which may be disagreeable. The criterion here adopted is to allow a confusion of 1/1200 of the focal length. Thus, if a picture taken with a lens of shorter focus is enlarged to the size it would have if taken with a 12-in. lens, the degree of diffusion will not be greater than 1/100 in. There is a reason for this standard. Ten to twelve inches is the correct reading distance, and at such a distance 1/100 in. of diffusion would not be noticeable. If the picture is further enlarged, the distance at which it is viewed should be correspondingly increased for correct perspective, so that the further enlarging of the confusion discs would not be noticeable. In fact, this standard gives a uniform tolerance at the correct viewing distance, which is the distance at which the image is formed from the lens.

This standard has the further advantage of being in accord with that tolerable in cinematography, which, according to Mr. A. Lockett, is 1/800 in. for sharpest definition, and 1/400 in. "tolerable." Now the focal length of cinematograph taking lenses varies from 1¼ in. to 3 in. On the above scale the allowance will be from 1/700 in. to 1/400 in., so that the criterion may fairly be considered universal.

Now as to the mode of construction. The usual formula connecting object and image distance is

$$1/v + 1/u = 1/f$$

u being the object distance and v the image distance for a lens of focal length f. For a second object

$$1/v' + 1/u' = 1/f$$

We write capitals for reciprocals so that

$$V - V' = U' - U$$

If the two images are to be "sharp" their separation must not be greater than the circle of confusion multiplied by the F/number, i.e., $eN/1200$ where f/N is the aperture.

i.e. $V - V' = U' - U = VN/1200$

For let P and P' (Fig. 1a) be the images of two points O and O', P being at a distance v and P' at v' from the lens. Light from O focussing at P will form a disc $Q\,Q'$ at P', and if O is to be considered as sharply imaged at P', $Q\,Q'$ must not be greater than the maximum circle of confusion. In the extreme case, when O is the furthest point from O', that is "sharp" at P', $O\,O'$ is equal to $f/1200$. It is obvious that a point O'', nearer the lens than O' will also form a circle of confusion

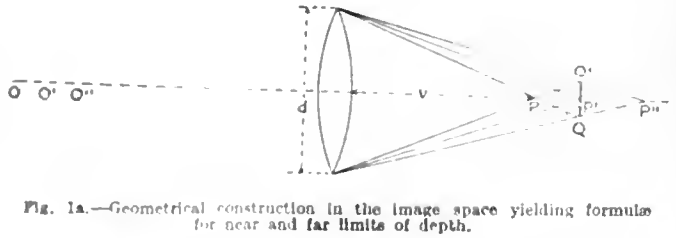


Fig. 1a.—Geometrical construction in the image space yielding formulæ for near and far limits of depth.

at P', focussing at P''. Then $O\,O''$ is the depth of field at O'. ($P\,P''$ is the depth of focus at P'.) From the drawing

$$\text{Circle of confusion } Q\,Q' = (v' - v) \times \frac{d}{v} = f/1200.$$

$$\text{Also } V - V' = \frac{1}{v} - \frac{1}{v'} = \frac{v' - v}{vv'} = \frac{f/d}{1200} \cdot \frac{1}{v'}$$

Now f/d is the F No., N

$$\text{so } V - V' = V'' - U = \frac{N\,V'}{1200}$$

$$\text{similarly } U' - V'' = \frac{N\,V'}{1200}.$$

In constructing the chart F (i.e., $1/f$) is marked off on the horizontal line OA and V on the vertical line OB. If a line OC at 45° to OB (fig. 1b) is drawn from the origin, horizontal distances from will represent $V - V'$, i.e., V. Now a line PN drawn from P

at a slope such that NQ/QP (= tangent of the slope of the line) = V/1200, then,

$$NQ = N/1200 \times PQ = VN/1200 = U' - U$$

and N gives U, i.e., the next distant point that is still in focus.

In constructing the chart it is convenient to use a table of reciprocals. The reciprocal of 10 is .1. Starting from the origin O a convenient distance is marked off, and the extremity marked 10, i.e., 10 in. focal length. The place for 12 will be 10/12 this distance from O, for 9, 10/9, and so on. The distances of the points 12, 10, 9, 8, 7, 6, being proportional to the reciprocals of those numbers. The same procedure

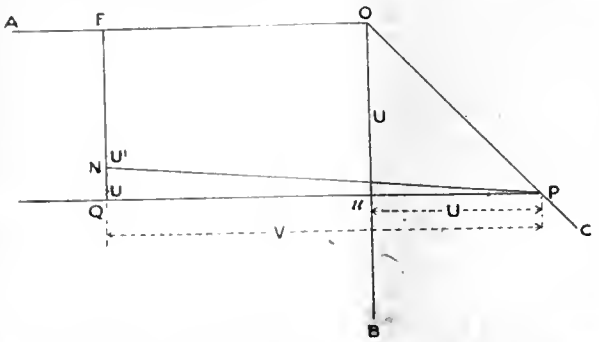


Fig. 1b.—Diagram of principle of constructing depth of focus chart in terms of reciprocals of object distances and focal length, and adopting a diameter of disc of confusion equal to 1/1200th of the focal length.

s made for object distance on the vertical line. Here it is convenient to work in feet, and any convenient scale can be chosen. To construct the line OC, a horizontal distance UP is marked off from OB (not shown in Fig. 2) equal to the reciprocal of the object distance *expressed in inches*, i.e. on the same scale as reciprocals of focal length have been drawn. Hence if object distances in feet have been drawn on the same scale as focal lengths in inches, the slope of OC against OB will be 1 in 12. In Fig. 2, focal lengths go from 6 in. to 12 in., and object distances from 8 ft. to infinity. Now the results will not change if both sets of figures are divided by any number, because the aperture

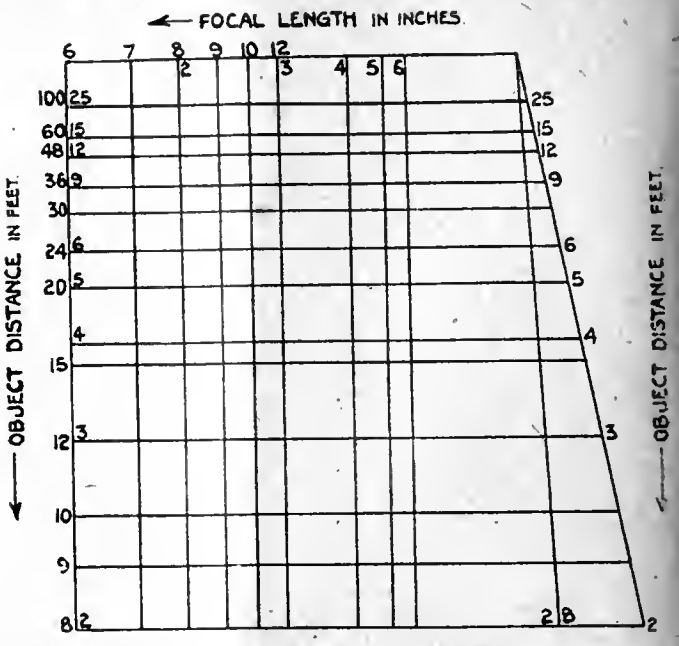


Fig. 2.—The chart—this part is the chart of distances and focal lengths plotted according to the rules explained by means of fig. 1b.

ratios are represented by angles, which will not change if Fig. 2 is reduced equally in both directions. Another set of figures is therefore shown representing focal lengths from 1½ to 6 in., and object distances from 2 ft.

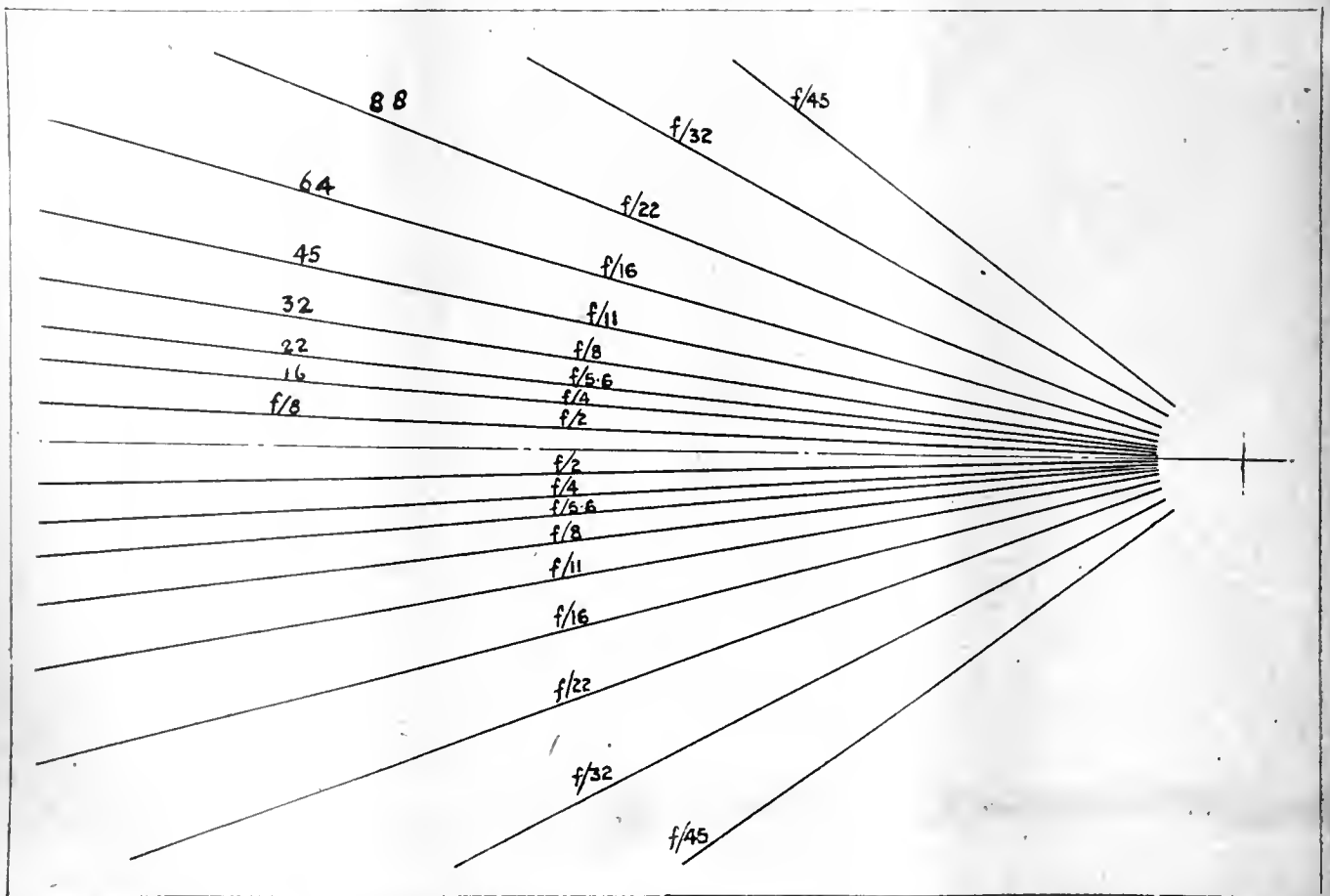


Fig. 3.—The chart—this diaphragm chart is drawn on transparent paper and in use is laid on fig. 2, as illustrated by the examples at the end of the article.

We must always remember to use *both* sets of inner figures, or both sets of outer figures, together. If we wish to use the outer set of focal lengths (i.e., 6 to 12 in.) with the inner set of object distances (i.e., down to 2 ft.), we have altered the relative scale of the figure and so require a new line, *OC*, which has a slope of 1 in 3 against the vertical, and we must use the *outer* set of figures on the aperture chart (fig. 3).

The construction of fig. 3 is perfectly simple, the line marked *f*/16 (e.g.), is drawn at a slope of 16/1200 to the horizontal line. In the case, however, above mentioned, of combining the outer set of focal lengths with the inner set of object distances, which is equivalent to increasing the vertical scale of fig. 2 four times, the vertical scale of fig. 3 must also be increased in this ratio so that *f*/8 becomes *f*/32, etc., according to the outer set of figures marked thereon. By combining these two scales the chart is diminished in size and works for *any* focal length (from 1½ in.), and aperture (from *f*/2) at *any* object distance (from 2 ft.). By the use of red and black ink, confusion between the two sets of figures is avoided.

The aperture diagram is drawn on transparent paper, so that it can be applied to fig. 2 for the solution of the problem under any set of conditions. Of course, it has to be seen that the central line *OA* (fig. 3), lies along a horizontal line of fig. 2. Corresponding to the two equidistant lines of fig. 3 bearing the same aperture number, are obtained two points that are in focus with the point focussed on, one nearer the lens and one more distant.

Let us consider a few examples that can be worked out by the chart. A group has to be photographed with a 10-in. lens, of which the nearest point is 20 ft. and the furthest 30 ft. What must be the aperture? Here, applying fig. 3, so that the centre travels along *OC*, and the axis keeps horizontal, it is seen that when the upper *f*/8 line cuts the 10-in. vertical at 30 ft. (both outer sets of figures), the lower *f*/8 line cuts it at 20 ft., the axis lying along 24 ft. Hence the lens should be focussed at 24 ft. and stopped down to *f*/8.

A 2½ in. *f*/4 cinematograph lens is working at 4 ft. What is the depth of field? Here we use both inner sets of figures and find a depth of focus from 3¾ ft. to 4¼ ft.

An object has to be photographed which is 2 ft. deep. At 5 ft. distance what must a 9½-in. lens be stopped down to? Here we use the outer line of focal lengths and the inner line of object distances, and consequently the outer *OC*. We see that the best place to focus on is at about 4 ft. 10 in., and the aperture must be *f*/32.

If a different degree of confusion is considered more suitable, the allowance is easily made, e.g., suppose a circle of confusion of 1/100 in. is considered passable, using a 6-in. lens. The latitude is here twice that allowed for in the chart. This means aperture numbers in fig. 3 may be divided by 2, i.e., *f*/8 considered as *f*/4, *f*/16 as *f*/8, etc. With this modification any desired degree of "sharpness" may be worked to

H. W. Lee, B.A.

CLAY'S METHOD OF MEASURING THE FOCAL LENGTH OF A LENS.

[The following description of an apparatus for measuring the focal length of a lens, which presents but little constructional difficulty, formed the concluding part of a lecture by Messrs. Vivian Jobling and E. A. Salt at the Croydon Camera Club, recently reported in these columns. Drawings have been made and text furnished to accompany them. They appear to cover fully all points likely to arise in the employment of this very ingenious and simple method.]

A highly ingenious and accurate method for determining the focal length of a lens, but now apparently but little used, was devised by Dr. R. S. Clay, and fully described by him in "Photography" of February 14, 1901. A subsequent lecture by him at the R.P.S. in 1904 is reported in the "B.J.," of August 25, pp. 748-749, and September 2, pp. 767-768, of that year.

The apparatus, as originally designed, was reduced to the simplest lecture-table form, and in reproducing it at the time the necessity of refinements became apparent for practical work. Accordingly we have modified the apparatus constructionally mainly on obvious lines, adopting a turntable capable of taking lenses large and small and of varying type, from a tiny R.R. to a large portrait lens. A centering arrangement among other minor, but essential, alterations has also been added.

The method depends upon the well-known fact that if a lens is turned, or swivelled, on a vertical axis which passes through the node of emergence, no movement on the focussing screen occurs when a distant object is focussed. The distance between the node and the focussing screen is then the focal length of the lens. A practical illustration of this principle is the panoram camera.

Difficulties arise, however, in applying the principle to determining the focal length of a lens. It is not easy to shield the screen from stray light; windows may not command a distant view, and if they do, atmospheric conditions are often not conducive to its sharp portrayal, especially if there be no clear-cut object included. A collimator can replace the distant object, but requires great accuracy in adjustment to avoid error, and is best left alone by the average man.

In the method devised and described by Dr. Clay a mirror replaces the distant object. Fig. 1 shows in rough sketch form the modified apparatus designed by us. A small hole illuminated from behind is fitted with cross-wires or equivalent. An adjustable turntable and superimposed carrier carry the lens (in error shown reversed in fig. 1, but correctly in fig. 4), and an adjustable mirror inclined at a slight angle is behind.

Light proceeding from the illuminated hole passes without deviation through the lens, and is reflected back by the mirror just above the hole, as shown by the lines A and B.

When a sharp image of the cross-wires is formed above the hole, and, *at the same time*, no movement of the image occurs when the turntable is swivelled on its pivot, then the horizontal distance between the cross-wires and a vertical line

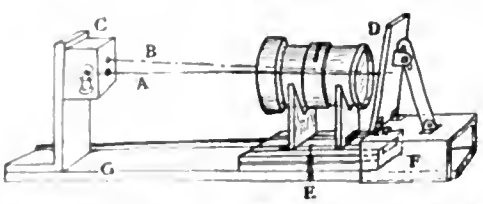


Fig. 1.—Diagrammatic sketch of apparatus for measuring focal lengths.
A.—Outward rays from light-source. B.—Return rays from mirror. C.—Box with lamp and cross-wires for focussing. D.—Hinged mirror with adjusting strut. E.—Pivot of turntable. F.—Support for mirror. G.—General platform with guide ledge.

coinciding with the axis of the pivot is the focal-length of the lens under test, whose node of emergence is immediately over the axis of the pivot.

The cross-wires being at the principal focus of the lens, the light emerges from it, and is reflected back by the mirror in parallel rays, and thus a distant object is replaced in very ingenious way.

Moreover, as Dr. Clay pointed out, by employing a mirror in lieu of a collimator or distant object, adjustments are made with at least twice the accuracy. Firstly, as regards the displacement of the image when the lens is swivelled in any other position, and, secondly, as regards the image of the cross-wires coming in and out of focus when advanced or retreated.

By reversing the lens the other node is found, the distance between the two nodes (a minus quantity with "crossed nodes") being the optical "no man's land," with which we are not now concerned.

The Apparatus.

The apparatus in its essentials consists of a long baseboard with projecting pin towards one end; a turntable drilled to

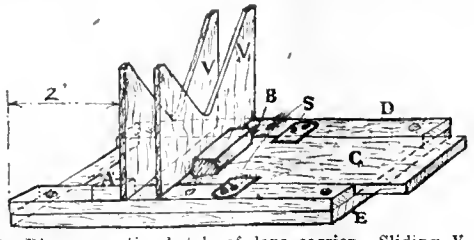


Fig. 2.—Diagrammatic sketch of lens carrier: Sliding V shown partially withdrawn as used with a small lens. Slide is held by pressure of the two metal springs S.
A.—Two stops fixing V to guides, ¾ x ¾ x ½ in. B.—Stop fixing V to slide, 1½ x ½ sq. C.—Slide, 7½ x 2¼ in. D.—Guide strips, 7½ x ¾ x ¼ in. E.—Base, 7½ x 3½ x ¼ in.

take the pin swivels on the baseboard. The turntable is provided with side-pieces or guides, between which the lens-carrier slides to and fro. The latter is also fitted with guides to take a sliding piece the whole length of the carrier, to

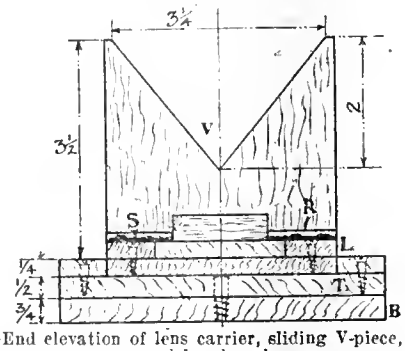


Fig. 3.—End elevation of lens carrier, sliding V-piece, turntable and baseboard.
B.—Baseboard. L.—Lens carrier. S.—Springs. T.—Turntable. R.—Sliding V cut away to clear springs.

which one V-support is fastened, as shown in figs. 2 and 3. The other is attached on each side to the guides on the lens-carrier, as shown in fig. 2. Behind it is an adjustable mirror supported by a bridge which spans the baseboard.

At the other end is the cross-wire carrier with rising and

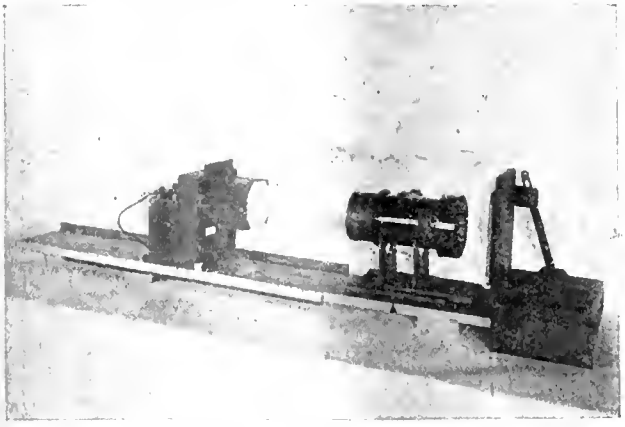


Fig 4.—Photograph of the apparatus.

falling front to permit of centering with the lens. The advanced position of the cross-wires is necessary if short foci lenses are to be tested; otherwise the carrier will foul the turntable. When advanced or retreated the carrier is pressed against a guide, shown in fig. 4, a graduated scale, and an index or pointer on the carrier being provided the other side. A clear glass "flashlight" bulb of 15 mm. diameter forms the illuminant run off an accumulator or dry-battery.

The apparatus has been designed to allow of plain-sailing construction by those least skilful with tools, who will find that by making exact paper patterns or drawings of the parts requiring them no real difficulties will arise. It may be modified in detail to any extent, provided essential features are retained. As a matter of fact, with the model illustrated in fig. 4 some oddments were pressed into service. The cross-wire carrier, for instance, was largely composed of a rising front taken from a Marion's "Radial" hand-camera to take 7 × 5 plates, quite a relic of the past. The photograph and sketches cover nearly all the ground as regards design and dimensions, but the following constructional notes may be of service to those glad of a little assistance at every step.

The Baseboard.

The length of the baseboard purely depends upon the focal lengths of the lenses to be tested, and is easily determined. Stout stuff should be employed, not less than ¾ in., and heavy cross pieces glued and screwed underneath. The board is then planed flat. If a carpenter is employed, test his work by laying a straight-edge across.

The Turntable.

The turntable (7½ in. × 5 in.) is of good ½ in. wood planed flat. A central line along its length is drawn and three holes bored, one central and two 1½ in. distant on each side. The latter will occasionally be found useful when respectively testing landscape lenses with the node behind and clear of the lens, and with lenses, like the Aldis and Cooke, which have their nodes well to the front.

The pivot is fashioned out of an engineer's brass screw about 1 in. × 3-16 in. The head is turned down to the diameter of the shank and rounded at the top. The baseboard is preferably "tapped" to receive it. It is necessary that the pivot be a close but not a jamming fit in the holes,

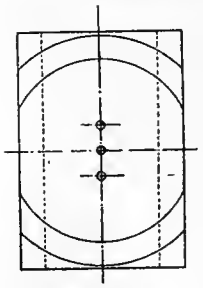


Fig. 5.—Sketch of turntable showing paper bearing strips on under side and alternate pivot holes.

for any play is almost fatal to accurate measurement. In the absence of a lathe any depôt undertaking repairs to motor cars will soon do the needful, and, having bench-drills, with screws, drills, and taps to gauge, a satisfactory job results.

Two pieces of thick smooth paper are glued or seccotined underneath the turntable, as shown in fig. 5, and any inequalities removed with fine glasspaper. The paper is given a coating of celluloid varnish, blackleaded, and polished.

The Lens-Carrier.

The lens-carrier must slide easily between the guides on the turntable, but without tendency to side-shake. It is to be noted that the two flat springs (fig. 2) bearing on the sliding-piece carrying one V-support must project but slightly, so as not to foul the block to which it is attached when drawn to the right. For the same reason this V-support is slightly undercut, as illustrated in fig. 3.

Should any difficulty be found in cutting the V's accurately they can be roughly done, and made larger. Protruding zinc strips can be cemented on (inside) and adjusted to correct position by laying on a paper pattern, and finally screwed down through holes previously drilled. For small lenses such a plan presents advantages, owing to the thinness

of the bearing surface. With a centre line drawn on the base and repeated on the sliding piece, with corresponding vertical lines on the V-supports, alignment is easy. The carrier, it may be remarked, is a slight modification of and an improvement on the one in the photograph.

The Bridge-Piece.

For a baseboard of 5 in. across the span of the bridge is about 7½ in. clear, the height just sufficient to clear the lens-carrier. The mirror is of ¼ in. plate, 6 in. long by 5 in. high, and, from a local dealer, cost 1s. cut to size. With a mirror of this thickness no trouble due to double reflection arises. The way in which it is held is obvious in the diagrams. In the photograph the mirror is shown on an independent support, which is unnecessary; the fitment happened to be at hand, and was utilised.

The Cross-Wire Carrier.

Any form of construction can be adopted for the cross-wire carrier, provided that the cross-wires have sufficient rise and fall to centre them vertically with the smallest and largest lenses likely to be tested. The protruding box is 3½ in. square, and faced with white paper or thin card on which a horizontal line is drawn midway. The projection of 3½ in. permits of focal lengths from 2 in. and under to be measured. Two slips of stout smooth paper are stuck under the base to act as runners, and one strip on the side next the guide, all three being treated in manner just mentioned.

If a small camera fitted with rising and falling front is available, its conversion may be easy if a sliding base with stop is employed, so that the camera can be replaced on the base in invariable position.

This is only necessary if a fixed graduated scale forms part of the apparatus. It can, however, be dispensed with, but in this case the turntable will probably have to be raised so that the top of the pivot be on the same level as the lowest limit of the cross-wires. A steel rule held horizontally will then read the distance between them and the pivot.

In any case the rising and falling front must operate truly at right-angles to the baseboard, which can be tested with a set-square.

Centering.

A lens is taken and both combinations removed, one being replaced with a card disc with small central hole. The lens barrel is placed on the V-grooves with the card towards the cross-wire carrier, which is brought up almost touching, taking care that both carriers are parallel with the baseboard. The front is either raised or lowered until the horizontal line drawn on the paper bisects the hole in the card, which is pricked through or otherwise marked, and the centre of the cross-wire aperture thus recorded. The front of the box is unscrewed, and, starting about 9/16 from the centre, circles are described in ink about ¼ in. apart to the edge of the box. A ¼ in. central hole is then drilled, and the inside cut away so as to permit the electric bulb to partly enter. It is screwed into a miniature barrel holder held by a thin brass strip forming a bridge-piece, and also one electrical contact.

The Cross-Wires.

A 1-in. square of acid-etched glass (or circle preferably, if it can be cut) is varnished, or retouching medium applied to the clear side. A mask of black paper, with a circular aperture of 3/16 in. (rather under than over), is seccotined to the etched side with the aperture central. Across it on the other side, in india-ink or "Photopake," bold lines and dots are made as indicated in fig. 6, and when dry fine lines and dots are scraped away with a needle for critical focussing. A small piece of very thin white paper exactly corresponding to the black mask is coated with celluloid varnish and stuck down on the clear side with its aperture coincident with that of the black mask. Just above the cross-lines a small area is coated with Chinese-white water-colour, quickly applied, which gives a nice surface for focussing upon. The square (or circle) of glass is then stuck to the front of the box *with the upright cross-line central*, centering being easy by inspection through the back. If a frosted electric bulb be used, or other means adopted for diffusion, a plain piece of glass can be employed in lieu of the etched.

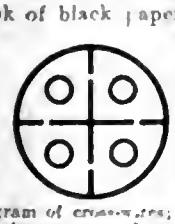


Fig. 6.—Enlarged diagram of cross-wires; the breaks in the lines and centres of dots are scraped away with a needle.

The Graduated Scale.

The graduated scale was constructed out of two 2d. wooden rules divided into inches and tenths, procurable anywhere. A paper band was stuck on throughout the combined length and the scale renumbered from 2 to 26 inches, as shown in fig. 4, with an index mark on a piece of white paper on the carrier above.

The scale can be accurately adjusted as follows:—With a carpenter's square and blade in contact with the pivot, rule a pencil line across the baseboard, and repeat the operation the other side of the pivot. Close to it make a pencil dot exactly midway between the drawn lines. Lay a steel rule down with any convenient division, say, 6 in., adjusted to the dot, and at the zero end of the rule bring a slip of card into contact, and temporarily secure it with two drawing-pins. Withdraw the rule and gently butt a set-square against the card, and bring the cross-wire carrier into contact with the set-square. If the index is now set to read 6 in. on the scale it will be accurately adjusted for all distances. With the two drawn lines as a guide, the position of the pivot can also be indicated on the edge of the baseboard, which will be found useful at times.

Making the Test.

The operation of the apparatus is exceedingly simple and quick. The lens is mounted on the V-supports, and the cross-wire carrier run up to its back and centered, the circles effecting this with ease. The cross-wire carrier is roughly set to the estimated focus of the lens under test, and the image of the cross-wires brought into the region of the illuminated hole by means of the mirror.

Should the node of the lens be other than over the axis of the pivot, swivelling the turntable will displace the image in amount dependent upon the distance between the two. If the direction of the image coincides with that of the turntable, the lens-carrier must be pushed towards the mirror; if in contrary direction, towards the cross-wires.

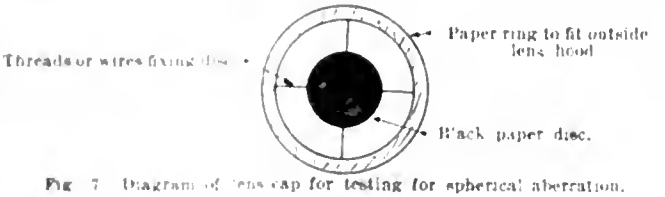


Fig. 7.—Diagram of lens cap for testing for spherical aberration.

In practice the lens-carrier is pushed well towards the cross-wires and gradually retreated until the movements of the image is reduced to small proportions. Frequent re-focussing at this stage is not required. Seeing that both carriers are parallel with the baseboard, the mirror is brought close up to the lens and adjusted so that the vertical cross-line and its reflected image are in the same straight line and almost overlapping. The image is sharply focussed, and the lens-carrier *gently and slowly* revolved through a moderate angle. When no displacement occurs final exact focussing is effected and the focal-length determined with exactitude. Dr. Clay says this may be done correctly within a few hundredths of an inch, but construction hardly admits of such precision; still it has been found that with well-corrected lenses measurements by different operators have agreed within 1/40th of an

inch, a degree of accuracy more than sufficient for all ordinary purposes.

With some objectives, such as portrait lenses, spurious images of the cross-wires may form, due to internal reflections, which come to a focus either behind or in front of the focal plane. Once recognised, they cannot be mistaken for the bright and sharply defined image afforded by the axial rays.

If spherical aberration is present in any degree the determination of the best average focus is a matter of some doubt. In such cases a medium stop should be employed.

Dr. Clay applied the apparatus to the measurement of the various errors existing in lenses, expressing their amounts by coefficients, but few will care to undertake this. Mostly, the presence or absence of aberrations can be determined in sufficient degree by inspection of the image on the focussing screen of a camera, but slight degradation of detail, due to want of aplanatism, is not so readily detected.

The well-known method of determining its presence or otherwise can be employed with the apparatus. Focus is respectively obtained with a medium stop, and with the special stop shown in fig. 7. If the readings coincide the lens is aplanatic; if not, spherical aberration is present.

VIVIAN JOBLING.
E. A. SALT.

CHATS TO A RECEPTIONIST.

FIRST of all, it is very desirable that your appearance should be smart and respectable, so that you can demand respect.

Showy dresses are against all business principles, black being the popular colour.

A successful assistant must have common sense and self-respect; it does not mean that you have to be a genius in order to use ordinary everyday common sense, yet common sense is the greatest money-maker in the market.

Always endeavour to be prompt at business, so that your employer will respect you. Remember, if you are late, he is entitled to an apology or an explanation, otherwise he will feel annoyed, though he may not show it.

There are only 60 minutes to an hour—no more. Forget private and home thoughts, and concentrate on the business and its welfare.

Relationship with Business.

Your position is a very important one—in fact, one of the main springs of the firm's clockwork, and on your ability rests to a great extent the success of the business. It is very essential that you should know all the business routine—in fact, as much as your employer knows about the salesmanship of photography. You are his mouthpiece; you are like the driver of a horse and vehicle, and hold the reins, can either let the horse wander its own way or direct it rightly, either let customers have what they ask for, or advise and lead them to something better.

You cannot expect your employer to look after *your* interests; you have got to rise or fall by your own personal efforts.

Fair Play for Both.

If your employer were not making a profit on your work, he would not be employing you. You will never be worth more money to yourself until you are worth more money to him. He is entitled to a fair profit on your services. He takes risks that you do not have to take. He supplies you with a place in which to work. He loses money when you make mistakes.

Be fair with him, as you expect him to be fair to you. The more money you can make for your employer, the more value you will have in his eyes. If you can show him that you are making more for him than his other employees, unless he is an idiot, he will pay you more.

Play as fair with your employer as you expect him to play fairly with you.

Manners.

Bad manners and treatment in the reception-room or shop often lead to a disappointing result. Assistants must always leave their tempers out of doors and must exercise the greatest power of self-control, remembering that soft words drive away wrath. When dealing with customers, try to listen to your own conversation, and consider if you think it sounds respectful and sympathetic.

Don't let people criticise you; criticise yourself. We are inclined to think that people have a warped judgment of our faults, whereas it is often ourselves.

One of the most important reasons why we must respect our patrons is because they provide for our daily bread.

To most people, having their photograph taken is a very distasteful occupation, and we cannot do too much to ameliorate their feelings.

Some people always expect many attentions, and are pleased to receive courtesies.

To be courteous shows good taste and is pleasing to all, but discretion and courteousness must go hand in hand. Sympathise with your clients and they will take your advice, especially those undecided. Begin well with a pleasant greeting; make them feel at home.

Get into the habit of sizing up your customers; try to read their character—at least, that part of their taste; try to imagine what they are likely to want and what suits them; it will require a certain amount of shrewdness, but it is easily acquired by practice. The bustling business man, the reserved old lady, the gushing maiden, and shy boy all require their various styles.

Customers object to a listless, apathetic assistant who makes no effort to realise the customers' wants.

Begin well; greet people with a smile and a pleasant expression; show an anxiety to serve them, and your success of a good order is assured.

Sitters expect a heap for their money—a smile of welcome tempered to an exact shade of deference, instantaneous attention, tireless courtesy, a vivid interest in their wants, all of which you can easily give them.

Most people think we run the show for their benefit, and we could not carry on without their patronage, which is quite true if we regard them as one of a thousand others thinking the same way.

Securing the Order.

Don't ram the prices down their throat.

Don't even mention the price, unless necessary, until the order is secured.

Always, where considered suitable, suggest the order to be one dozen, etc. Try to forget, or pretend, we don't do smaller amounts, unless circumstances require it.

It sometimes pays to be deaf to their inquiries. Climb down to the lower quantities or cheaper lines if the customer's position demands it. Don't rob them, but secure all you can; leave them with enough car money to get home with. Any fool can sell people what they want, but it takes a clever saleswoman to sell what they don't want.

Whether the style selected is a cheap one, or for a copy, always quote the extras inclusive, so that the customer is not aware of any extras

The reason why styles are published in 3's and 4's is to bring people in (otherwise the doorman), and then the firm relies on your skill and ability and make good on that. The better you know your business, the better your chance of success.

When a customer returns with proofs, always try to increase the order. This will benefit you as well as the firm; keep in your mind the various ideas of suggestive specialties which you can recommend for their consideration, enlargements, miniatures, etc., etc. A commission is given to encourage you to push these extras.

A knowledge of various technicalities is very useful when discussing complaints, or points of interest, such as how a negative is made, how and why it is retouched, the making of the print, etc.

Photographs Reproduced.

Bear in mind that photographs brought in to be reproduced or copied are generally of their *dear relatives*, and must be carefully handled, thoughtfully considered, and judiciously commended. If it is not exactly sharp and clear, don't say it will reproduce clearly, but that the best will be made of it, and that possibly in most cases it can be made to look better.

Delivery of Work.

Always be ready, if work is not complete, to express regret, and say you hope to have it ready in a few days. Don't give a definite time and commit yourself unless you know it will be ready. Always strive at keeping your customer in a good humour.

If we have a mount or frame that will suit the order in hand, make every effort to effect a sale; it is possible that every photograph taken will be framed eventually, and why shouldn't you sell that frame?

In some cases you might secure the order to have the photograph coloured.

If customers show disappointment in the results, use great tact and try to convince them otherwise, unless an improvement can be usefully applied. Be familiar with all prices. Knowledge, tact, and push must eventually lead to success. With good education, good disposition, and tact the receptionist could almost double an ordinary business as soon as she discovers the difference between opportunity and importunity.

The Reception Room.

Everything about the place should reflect order, thrift, cleanliness and system. Here all the honour (and profit) lies. There should be an atmosphere of cheerful refinement, and not that of a tuckshop.

All specimens to be kept in order and replaced when soiled, etc., or out of date; suggestions made for better appearance when conditions demand it.

J. F. SLACK.

HOW THE ROYAL WEDDING ABBEY PHOTOGRAPHS WERE TAKEN.

Some remarkable photographs were taken in Westminster Abbey on the occasion of the wedding of Princess Mary to Lord Lascelles, and in spite of the dim lighting which the Abbey affords the resulting pictures were as perfect as any studio or cinema producer could expect to secure.

Great difficulty had been experienced from the first in obtaining facilities and privileges to admit photographers to record this historic scene, but difficulties were at length overcome, and the Newspapers Proprietors' Association were able to appoint Mr G. Lymbery, of "Photopress," and Messrs. Neal and Console, of the "Daily Mail," to act as official photographers. It was also decided that the resulting negatives were to be pooled, so that one should cover the other in case of failure.

A special stand was erected in the Abbey, but not in a favourable position, because of a big chandelier carrying glaring lights coming almost over the heads of the Royal party. Fortunately, however, the backed plates used minimised halation. Imperial "Eclipse" and Ilford "Zenith" 650 H and D plates were chosen after exhaustive tests had been made, and the photographers nervously awaited the critical moment.

Immediately the bride with her Royal father arrived at the altar steps the photographers began exposing plates for all they were worth, and something like half a gross of plates in all were exposed on the subject. The light was extremely good, three seconds being the maximum exposure at *f*.4.5. The favourable light tempted Mr. Neal, who was using a Cooke-Aviar, to stop down to *f* 8, and give a longer exposure at a time in the ceremony when very little movement was happening, this produced a brilliant and well exposed negative, full of detail, which was the one from which prints were made for the general Press.

A special messenger service had been established, and the first batch of plates left the Abbey at 11.40, these plates were conveyed via Parliament Square to the House of Commons, where the Underground passage leading to Westminster Station was specially opened for the purpose, and at the other end of this passage further messengers were in readiness to convey the dark slides to Fleet Street. No time was lost in development, and prints were already on their way to the evening newspapers before the Abbey ceremony was finished, prints also being on the trains to provincial centres before the carriage conveying the couple had returned to Buckingham Palace. Aeroplanes were called into requisition to carry the photographs to Paris and Manchester. The results were a great achievement for British plates and lenses.

Photo-Mechanical Notes.

The Use of an Optical Enlarger to the Lithographer.

An optical enlarger is a necessary apparatus in a modern lithographic establishment where poster and large work is executed. One use to which it is employed is to obtain the key in chromelithography. This key enables the litho artist to place each colour in its correct position on the various stones used in the reproduction. The photographic method of obtaining the key is to photograph the original upon a plate which renders all detail. The intelligent use of panchromatic plates or film and filters is therefore essential in most cases. The negative obtained must be one that is not dense, but has the details in the colours well emphasised. This negative is enlarged to the required size upon a glossy bromide paper. Development and exposure of the bromide print must be so regulated that the result has no blacks in the shadows, but every detail must be well defined. It is generally advisable to dilute the developer with equal parts of water to obtain this effect. The enlargement, when dry, is passed on to the litho artist, who places a sheet of transparent tracing paper or gelatine over the image, and then proceeds to outline all the detail with a black transfer ink. It will now be seen that if the bromide print shows strong contrast it would be difficult for the artist to see and follow the detail. This outlining can be made upon the actual surface of the bromide print, and when finished is transferred to a litho stone in the usual way. Prints are made from this keystone upon a special paper, and then dusted with an offset powder which adheres to the ink image. This outline is laid on a damp litho stone and passed through the press, the result being a faint violet outline of the colours to be reproduced on the stone. This operation is repeated as many times as there are stones for the reproduction.

Another method is to make a small transparency from the negative, which is placed in the enlarger and projected to the required size on to a sheet of transfer paper. On this the artist outlines the detail. The Eastman Projection Printer is especially suited for this class of work, as it enables the artist to work in the accustomed position when drawing, which is not possible when using the ordinary form of enlarger. It is quite practical to make screen and grain negatives for poster work in this enlarger, the method of working being as follows: A small continuous tone negative is first made upon a small plate from the original. This negative must be of a good quality, and when dry, is placed in the holder of the enlarger and projected to a convenient size. No focussing is necessary when using a Kodak enlarger of this form, as the focussing is automatic and the image always sharp. Lay a process dry plate, which should have a backing of black or brown paper, upon the enlarging table, and over this plate bridge a half-tone screen, the ruling selected depending upon the size of the poster. The screen must be adjusted to a certain distance above the sensitive plate, which varies with the screen used. The following table will give the distance:

100 lines to the inch = 15 mm. distance.
120 lines to the inch = 12 mm. distance.
150 lines to the inch = 10 mm. distance.
170 lines to the inch = 8 mm. distance.

This screen distance can be maintained by supporting the screen on strips of wood cut to the above thickness. Fig. 1 shows an outline of the arrangement.

The stop to use for the shadow exposure is one having a diameter of 1/100 the distance of the lens from the sensitive plate, and that for the highlights 1/50. The exposure for the shadows is approximately 30 to 50 seconds, and that of the highlights 3 to 8 seconds, this being for an average negative. Develop for about 2 minutes at a temperature not lower than 65 deg. Fahr. in the usual hydroquinone-caustic. The result should be a screen positive, showing the high lights as small dots, or entire absence of the same, the middle tones as larger dots, the half-tones being joined together, and those

of the lowest almost overlapping or completely closed in. If the dots are too large they can be reduced by the usual methods, or if not dense enough be intensified, the silver cyanide intensifier being especially suited for the purpose. From this screen positive the enlarged screen negative is made to the size required on a well-drained wet-plate, which is laid on the enlarger table. Another method is to enlarge upon a sheet of Transferotype Bromide paper, and then transfer to a substratumed glass support. If a very large result is wanted two or three prints or even more can be joined together, the result being an enlarged screen negative, which is printed

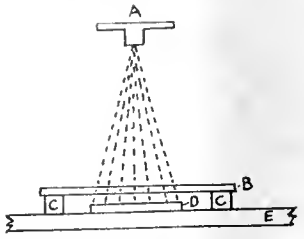


Fig. 1.—A. Lens of projector. B. Half-tone screen. C. Wood support for screen distance. D. Sensitive plate. E. Table of projector.

in the usual way either upon litho zinc, or if made for half-tone upon copper or zinc. To obtain a grain negative the positive is made by placing a metzograph screen of suitable grain in contact with the dry plate on which the positive is made, and exposing through a very small stop. It will be seen that by using this method there is no need to purchase large screens; one of moderate size is quite sufficient. The enlarger will also prove of great use when employed as an optical pantograph, and in many other ways supplies a long-felt want in the working of modern lithography.

W. J. Smith, F.R.P.S.

The following patents have been applied for:—

Cameras.—No. 5,602. Photographic cameras for process work. F. J. Connolly, Ltd., and F. H. Salisbury.

Intaglio Printing.—No. 5,566. Rotary intaglio or photogravure printing-machines. W. Gamble and A. W. Penrose & Co., Ltd.

Exhibitions.

MR. BANFIELD'S PICTURES AT THE CAMERA CLUB.

Mr. Banfield's exhibition at the Camera Club reveals him as a photographer with a keen landscape-sense. His taste is catholic. Some of the compositions are planned in the grand style and endowed with the magic of luminosity one experiences before a Claude or a Turner. Others, again, are quite modern in inception; one or two are suspiciously near being "beautiful facts." But even these have an idea in them; usually an idea of line-pattern. Perhaps the most forcible example of this variety of Mr. Banfield's work is his very queer "Towpath, Guildford," which seems to claim its place here on the strength of its great sweeping lines. But it is queerness alone, not beauty, upon which the thing sues for admiration.

Another work in which composition is obvious is "November Morning, Godalming." But this is not an aggressive design like the other; it is simply a well-behaved composition wherein everything falls happily; as everything likewise does in the highly-successful "Lincoln's Inn Fields."

From a long experience of photographic pictures I have come to believe that composition is the easiest part of the artistic equipment to acquire. The trick is quickly picked up, and once learned is never forgotten. But proper tone-relation is an accomplishment that comes much later and sometimes never. It is because these matters are so elusive that the average spectator, in such an exhibition as the present, cannot put his finger on faults; he only feels that something is not quite convincing. Thus the camera man escapes a good deal of censure in this department of artistic expression.

The works here are, with one exception, agreeably free from obvious wrong tone-relation; the exception being "Ludlow Castle," where the bridge forms a dividing line between two different keys of tone over the self-same objects. Almost every other picture offers some little solecism upon mature consideration; but in a general way, effects of light and atmosphere are rendered with an attractiveness above the common. Perhaps the finest result of this kind is seen in "Lincoln's Inn Fields," with its motive of sunbeams. In the rather anomalous "Piccadilly," what ought to have been a triumph of light-laden mist effect in an impressive scene is robbed of all naturalism by being in far too low a key—it is an impossible mixture of murky fog and slanting sunshine. However, as a piece of tone, considered apart from naturalism, it is delightful.

Most of the works are bromoils, and, as such, are highly accomplished works. They include a selection of heads and portraits which show originality of idea. The finest and most ambitious of these is certainly "Karsavina"—with its rich tones and sparkling accents. The pose and the face are both beautiful, although the left hand is unfortunate in its arrangement.

On the whole, the show is a display of sound technique and artistic feeling.

F. C. Tilney.

FORTHCOMING EXHIBITIONS.

March 4 to 25.—South London Photographic Society. Particulars from the Hon. Secretary, Harry Abbott, 61, Beauval Road, East Dulwich, London, S.E.22.

March 14 to 16.—City of London and Cripplegate Photographic Society. Particulars from the Hon. Secretary, J. J. Butler, 7, Gresham Street, London, E.C.2.

March 15 to 26.—Welsh Salon of Photography. Particulars from the Secretary, H. G. Daniel, 154, Penylan Road, Cardiff.

March 16 to 18.—Leytonstone and Wanstead Camera Club. Particulars from the Secretary, Charles Wormald, 1, Colworth Road, Leytonstone, London, E.11.

March 27 to April 8.—Dennistoun Amateur Photographic Association. Latest date for entries, March 14. Particulars from the Exhibition Secretary, Colin Graham, 448, Duke Street, Dennistoun, Glasgow.

March 28 to April 1.—Hackney Photographic Society. Hon. Secretary, Walter Selfe, 24, Pembury Road, Clapton, London, E.5.

April 5 to 8.—Leicester and Leicestershire Photographic Society. Latest date for entries, March 22. Particulars from the Hon. Secretary, W. Bailey, Cank Street, Leicester.

April 5 to 8.—Faversham Institute Photographic Society. Latest date for entries, March 31. Particulars from the Hon. Secretary, W. H. Evernden, 116, West Street, Faversham.

April 21 to May 11.—Hammersmith Hampshire House Photographic Society. Latest date for entries, March 30. Particulars from the Hon. Exhibition Secretary, J. Ainger Hall, 26, Bishop's Mansions, Bishop's Park Road, London, S.W.6.

May 1 to 6.—Photographic Fair. Horticultural Hall, Westminster. Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1.

September 11 to 15.—Professional Photographers' Association, Princes Galleries, Piccadilly, London, W. (Trade and Professional). Hon. Secretary, Richard N. Speaight, 157, New Bond Street, London, W.1. Also foreign invitation loan exhibition of professional portraiture. Hon. Secretary, Marcus Adams, 43, Dover Street, London, W.1.

September 18 to October 28.—Royal Photographic Society. Latest date for entries by carrier, August 25. Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

Mary Pickford's Camera Man.—A daily paper, speaking of Miss Mary Pickford, and her methods of producing pictures, says:—"Mary is very proud of her camera man, who is said to be the best man at his job in America. He is Charles Rosher, an Englishman, and he was with a well-known Bond Street firm of photographers before he took to moving-pictures."

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications February 20 to 25:—

REFLEX CAMERA.—No. 4,917. Collapsible photographic reflex camera. B. Foulkes-Winks.

CAMERAS.—No. 5,554. Photographic cameras. F. L. Burger.

DRY-MOUNTING.—No. 5,506. Press for dry-mounting photographs, etc. P. J. Burrell and R. W. Homewood.

PRINTING FRAMES.—No. 5,316. Photo-printing frames. E. W. Davies.

TRIMMING-GUIDES.—No. 5,538. Trimming-guide for photographic printing-masks. E. B. Fry and E. B. Fry, Ltd.

PASSE-PARTOUT BINDINGS.—No. 5,539. Passe-partout edge bindings. E. B. Fry and E. B. Fry, Ltd.

PRINTING BOXES.—No. 5,540. Printing-boxes for photographic films. E. B. Fry, E. B. Fry, Ltd., and R. Sutton.

PROJECTION METHOD.—No. 5,601. Projection of photographic and photo-mechanical images. A. Hamburger.

VERTICAL ENLARGING.—No. 4,939. Vertical enlarging photographic apparatus. F. Overton.

SHUTTERS.—No. 5,397. Photographic shutters. F. A. G. Pirwitz and A. Wollensak.

PRINTING-MACHINES.—No. 5,650. Photographic printing machines. E. Sankey.

IMAGE TRANSFORMING METHOD.—No. 5,256. Method of transforming photographic silver images into tanned gelatine images. P. Schrott.

MOUNTING.—No. 5,163. Means for mounting photographs, etc. J. C. Suddards.

SENSITIVE PAPER.—No. 4,957. Photographically-sensitive paper. A. R. Trist.

PROJECTION SCREENS.—No. 5,084. Optical projection screens. A. Blaut.

CINEMATOGRAPHY.—No. 5,324. Apparatus for cinematographic photography. F. E. Cadett.

CINEMATOGRAPHS.—No. 5,407. Cinematographs. B. Gwozdz.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1s. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

STEREOSCOPIC CINEMATOGRAPHY.—No. 173,833 (September 25, 1920). The two members of each stereoscopic pair of pictures are simultaneously superimposed on the screen, the pair following each other in the same rapid succession as is required in the projection of cinematograph film of normal width.

A cinematograph lantern may be used, having two internal sections fitted with twin lenses, with their centres spaced apart so as to coincide with the respective centres of the pairs of stereoscopic photographs on the film.

The extra-wide gate is constructed in two sections and hinged at the centre, each section corresponding to each member of a stereoscopic pair of photographs. The central hinge enables each section of the gate to assume the angular position for each member of a stereoscopic pair to be refracted in an oblique direction capable of bringing it on the same centre of the screen, i.e., each superposed on the other. Fig. 1 is a diagram of the gate in plan, and fig. 2 is a front elevation. In these diagrams D is the guide groove, D^1 is the gate frame, D^3 is the central hinge, D^4 is a slot in the thickness of the frame constituting the gate which allows the hinge to work so that the two halves of the gate may be inclined towards each other and thus produce the slight angle at the centre of the film above referred to, the natural elasticity of the film automatically restoring it to its flat condition as it leaves the gate and is wound on the receiving reel; K^2 are the axle of spring rollers (not shown in fig. 1) which are in adjustable contact with the film to minimise friction and generally regulate its motion in passing through the gate.

An illuminant and condenser are fitted for each half of the gate, and each set of these is mounted on a platform B B (fig. 3), to which is connected a corresponding section of the gate so that the latter can, by virtue of its central hinge, freely assume the angle necessary for the convergence of the two projected rays from the twin lenses without interference with the sprocket (shown on dotted lines at S^1, fig. 3) or the other mechanism of the projector. Fig. 3 is a diagram of the general arrangement as described. A A are the twin lenses, D^1 D^1 are the two

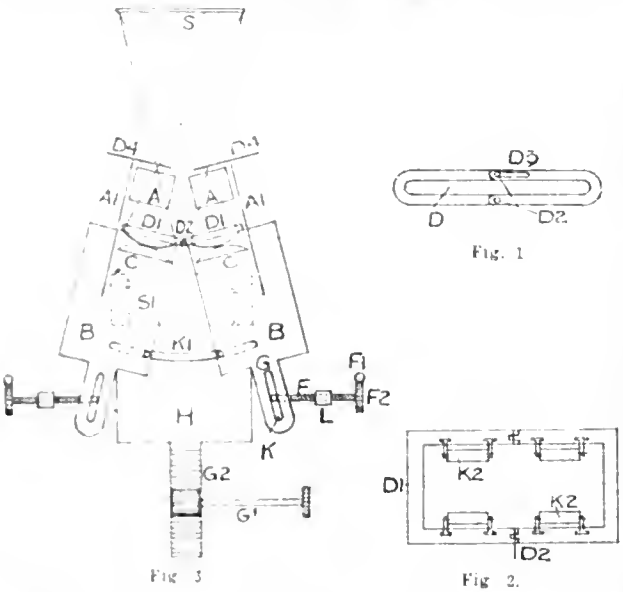


Fig. 3. Fig. 1. Fig. 2.

sections of the gate, D^3 being the hinge at the centre. A rotating shutter D^5 of the usual type to each lens is mounted on a shaft A^1 and is connected with the continuous moving mechanism which controls the Maltese cross, or "dog" movement of the sprocket, by suitable bevel gearing the teeth of which are of such an angle and depth as to allow a slight margin of play in order to give the small travel of the lenses towards each other which is required to produce convergence on the screen.

Fig. 3 shows on the rear of each platform B an extended bar or lug bearing a slot K in which works a stud on a loose collar at end of shaft F which has a screwed part working in a fixed nut L, F^1 and F^2 being a worm and worm-wheel respectively. This arrangement is designed to give a maximum of delicate adjustment of the twin lenses, combined with a locking effect in any position of the lenses which may be determined upon. The base H has a semi-circular slot K^1 and the platforms are connected movably thereto by pins taking into the slot; the platforms are also connected to the base by the pins of the central hinge of the gate continuing down and into a socket in the base. A rack and pinion movement, as shown at G^2 and G^1, enables the desired focus of the two halves of the images to be obtained on the screen S. The two sets of condensers are indicated at C C.

The screen S is a sheet of ground glass with the plain side nearest to the lenses. A mirror or other reflecting surface of

Fig. 4.

equal angular dimensions to those of the screen is placed behind it and above it at such a height (about equal to the depth of the screen) and at such an angle thereto as to collect the image from the ground glass screen and allow it to be seen easily by inspection from the front. Fig. 4 shows this arrangement, and L^1 is the lantern, S the ground glass screen, and M^1 the reflecting mirror. An alternative plan dispenses with the reflecting mirror:

the ground glass screen only is used with the ground side towards the lantern and the plain side backed with a rough, white surface such as white blotting paper. In this arrangement also the screen is to be viewed from the front, *viz.*, looking from the lantern The image on the ground glass screen itself (omitting the mirror) can also be viewed effectively directly at the back of the screen—*viz.*, looking towards the lantern.—Samuel Dickinson Williams, 8, Faulkner Road, Newport, Mon.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SUNDAY, MARCH 12.

United Stereoscopic Society. 1920 Competition Slides.

MONDAY, MARCH 13.

Bradford Phot. Soc. Members' Print Night.
Dewsbury Phot. Soc. "Wentbridge." W. E. Gundill.
Kidderminster P.S "Cornwall and the Lyonesse." F. W. Pilditch.
Nottingham P.S. "Fair Lusitania."
Southampton Camera Club. Ladies' Evening.
South London P.S. "Composition in Landscape." R. H. Lawton.
Wallasey A.P.S. "Through the Grecian Archipelago and Near East." W. Butcher & Sons.
Walthamstow P.S. "A Further Chat on Pictorial Composition' S. Brigden.

TUESDAY, MARCH 14.

R.P.S. Annual General Meeting.
Belfast C.P.A. Camera Club. "Art as Applied to Photography." S. Leighton.
Bournemouth C.C. Instructional Evening for Beginners. J. Thomas.
Cambridge Phot. Club. "Picture Making in Northern Italy." G. H. Dannatt.
City of London and Cripplegate P.S. "The Glory that was Rheims." E. W. Harvey Piper.
Exeter Camera Club. "Mespot and Persia." A. O. Rowden
Hackney P.S. "Lantern Manipulation." J. Williams.
Leeds Phototgraphic Society. Members' Lantern Evening.
Nelson Photographic Society. Members' Exhibition.
South Glasgow C.C. "Camps and Camping." Thos. Lochhead.
South Shields P.S. "Cloud Formation." John Heys
Stalybridge P.S. "The Hand Camera in Use." T. A. Greenall.

WEDNESDAY, MARCH 15.

Borough Poly. P.S. "Pictorial Work in Great Cities." A. H. Blake.
Catford Camera Club. "Colour Photography." W. E. Unwin.
City of London and Cripplegate P.S. "Ely Cathedral." H. W. Fincham.
Croydon Camera Club. "Southern Italy." W. Sanderson, J.P.
Dennistoun Amateur Phot. Assoc. Prize Slides.
Edinburgh P.S. "Bromoil Process." G. H. Hanlin.. And Lantern Slide Competition.
Forest Hill and Sydenham P.S. "Retouching."
Ilford P.S. "Simple Portraiture." C. R. Wormald.
Partick Camera Club. Third Lantern Slide Competition.
South Suburban P.S. "Bromide Enlarging." A. G. Buckham.

THURSDAY, MARCH 16.

Camera Club. "Portraiture in Colour." C. Pollard Crowther.
City of London and Cripplegate P.S. "Wonderlands of the Western World." J. Dudley Johnston.
Gateshead C.C. "Bromide Toning." J. T. Carnaby.
Letchworth C.C. Lecture. J. W. Swan.
Liverpool Amateur P.A. "In the Shires of the Sea Kings." Rev. S. R. Laundy
North Middlesex P.S. Visit to Bolt Court School of Engraving and *Daily Mirror* Offices.
Rochdale Amateur P.S. "Bromoil." F. Greenwood.
South Glasgow Camera Club. Whist Drive.
Tunbridge Wells Amateur P.S. "What to Take" and "What not to." H. Wild.
Welfare C.C. "Art in Relation to Photography." James Huck.
Wimbledon C.C. Lecturette Competition.

FRIDAY, MARCH 17.

R.P.S. Pictorial Group. Criticism of the Affiliation Competition Prints by J. Dudley Johnston (in conjunction with the Affiliation of Photographic Societies).
Wombwell P.S. Kodak Lecture.

SATURDAY, MARCH 18.

Leeds Camera Club. Exhibition of Members' Work.
Walthamstow P.S. Visit to a London Picture Gallery.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, March 7. The president, Dr. G. H. Rodman, in the chair.

The programme was arranged by the Scientific and Technical Group, and included the following subjects.

A paper was read by Mr. Howard Farmer on "Direct Photography." After pointing out that his method is a triumph over the ordinary negative method, which is a complete and absolute wash-out, Mr. Farmer informed his audience that he was not giving his secret away. Although the lecturer was listened to for an hour, during which he gave some delightful talk, and exhibited some excellent results achieved by himself, his hearers were left little or no wiser.

The next paper, by Mr. H. W. Lee, B.A., upon a "Chart for Finding the Depth of Focus with given Aperture and Distance of Object for any Photographic Lens," was read by Mr. F. Simeon. The gist of this communication will be found on another page, the paper having already been communicated to the "British Journal" by Mr. Lee.

Mr. H. Flower then read the third paper, one by Dr. W. E. Bradley, entitled "The Carbonisation of Bromides (a simplified Ozobrome Process)."

The sensitising solution is made up as follows :—Take, of a 5 per cent. solution : Potassium ferricyanide, 6 ozs. ; potassium bromide, 6 ozs. ; potassium bichromate, 4 ozs. ; water, 5 ozs.

The unsensitised tissue is immersed in this solution until limp. It is then drained and rinsed in clean, cold water, and transferred to a neutralising acid bath consisting of 1¼ oz. of a 10 per cent. solution of hydro-bromic acid in 80 ozs. of water for about 60 or 80 seconds. The tissue and bromide print are brought into contact under water, and after being squeegeed are put under pressure for about 30 minutes.

To carbonise the bromide picture direct, transfer the sandwich to warm water, as in carbon printing, and wash off the soluble pigment. On the other hand, to make a transfer place the sandwich in cold water, and separate the prints. Squeegee the carbon tissue to the transfer paper, and place under pressure for half an hour, and carry on the process as before and in hot water. The bromide print will be bleached and can be re-developed. Alum, citric acid, etc., are not required in this process. Good results are, of course, only obtained by using good bromide prints.

A hearty vote of thanks was accorded to the authors and readers of the papers in the usual way.

CROYDON CAMERA CLUB.

It has been the custom for Mr. F. Ackroyd once a year to favour the club with a lantern-lecture entitled "Travellers' Samples," and although the material sometimes has been slender, often a mere record of a short holiday, yet he always succeeds in interesting his audience with a combination of humour and wide general information

Nothing compels an accurate description of the quality of the slides usually produced, and the admiration induced by the cast-iron nerve required to show them in some subtle way eventually extended to the pictures on the screen. Possibly because they so consistently came up to expectation.

Last week "More Samples" provided a rude shock, primarily due to the misplaced zeal of the secretary, Mr. Sellors. Being possessed of a Sanger Shepherd density meter, he fatuously and foolishly lends it to Mr. Ackroyd, together with home-made slide-rules and photometric scales, and instructs him in their use. And with dire results, for gone, probably never to return, were all the dear old characteristics. Certainty replaced speculation as to what any particular slide was intended to represent, and in general quality the slides might have been the work of any ordinary skilled worker. They owed their origin to a tiny V.P. Kodak fitted with anastigmatic lens He made good with a highly interesting travel lecture, and was accorded a hearty vote of thanks.

THE SUPPLY OF RADIUM.—In a lecture on Radio-Activity, at the Royal Institution last Saturday, Sir Ernest Rutherford stated that the total amount of radium in existence at present was about 160 grammes. The commercial price was £20 per milligramme.

Commercial & Legal Intelligence.

LEGAL NOTE.—Notice is given, pursuant to Section 242 (5) of the Companies (Consolidation) Act, 1908, that the names of Sheffield's Studios, Ltd., and Photographic Art Development Co., Ltd., have been struck off the Register of Joint Stock Companies, and that the companies are dissolved.

NEW COMPANIES.

E. G. FILM PRODUCTIONS, LTD.—This private company was registered on March 1 with a capital of £1,000 in £1 shares. Objects: To carry on the business of photographers, opticians, manufacturers of and dealers in photographic apparatus, etc. The subscribers (each with one share) are: W. S. Blandford, Sarre House, East Finchley, N.2; E. W. E. Blandford, 227-8, Gresham House, E.C.2. The first directors are not named. Registered office: 227, Gresham House, E.C.2.

O. RUHL (1922), LTD., has been registered as a private company, with a nominal capital of £10,000 in £1 shares (5,000 8 per cent. cum. pref.), to carry on the business of manufacturers of and dealers in cameras, photographic materials and appliances, etc. The directors are: Friedrich Otto Ruhl, 50, Roxburgh Park, Harrow; Edgar Oscar Sommerfeld, Uplands Road, Hornsey. Solicitors: Albert M. Oppenheimer, 31, Queen Victoria Street, E.C. The registered office is at 15-17, Middle Street, Aldersgate, E.C.1. File number 180,054.

News and Notes.

"THE CLUB PHOTOGRAPHER."—The editorial offices of this well-known monthly have been removed to 81, Dale Street, Liverpool, to which address all communications should now be sent.

"THE PHOTOGRAPHIC JOURNAL."—The advertisement department of the Royal Photographic Society's "Journal" has been transferred from 63, Ludgate Hill, E.C.4, to the Society's house, 35, Russell Square, W.C.1.

CARBRO DEMONSTRATIONS.—A series of half-hourly demonstrations of the Carbro process will be given at the offices of the Autotype Company (74, New Oxford Street, London, W.C.1.) between 3 and 5 o'clock on the afternoons of Thursdays, the 16th and 30th inst.

THE NEW PRESIDENT of the Royal Photographic Society will be Mr. W. L. F. Wastell, whose name stands alone (under the heading of President) on the balloting paper. Mr. Wastell, who is now one of the Society's Vice-Presidents, has been an active and popular member of the Council for many years.

FALLOWFIELD'S CLEARANCE SALE of surplus stock commences on Monday, 20th inst. Many bargains in all types of cameras, lenses, enlarging apparatus, etc., will be obtainable, and a special sale list will be sent free to any of our readers who write for it; address, Jonathan Fallowfield, 146, Charing Cross Road, London, W.C.2.

ROYAL INSTITUTION.—On Thursday next, March 16, at 3 o'clock, Dr. P. Chalmers Mitchell begins a course of two lectures at the Royal Institution on "The Cinema as a Zoological Method." The Friday Evening Discourse on March 17 will be delivered by Professor A. P. Laurie on "The Pigments and Mediums of Old Masters," and on March 24 by Professor F. G. Donnan on "Auxiliary International Languages."

NEW ZEALAND CUSTOMS TARIFF.—The revised customs tariff of New Zealand contains many items of photographic interest. A preferential rate is accorded to goods produced or manufactured in any part of the British Dominions, including British Protectorates. Under this British Preferential Tariff photographic chemicals are dutiable 20 per cent. ad val.; lenses, unmounted and without attachments, free; cameras, free; camera covers, and cases, 20 per cent. ad val.; sensitised surfaces and albumenised paper, free; albums, cinematograph films, and other photographic goods, 20 per cent. ad. val.

AERIAL PHOTOGRAPHY. We learn from an American contemporary that aerial photography has been developed by the army air service to a point where the 3,026,789 square miles comprising the continental United States could be photographed in a comparatively short time. Secretary Weeks, of the War Department, announced recently that one airplane had succeeded in making a composite picture of 150 square miles of land in nine days. With the use of other machines, equipped with devices developed by the air service, he said it would be a simple task to picture the United States as a whole. An interesting feature of the work, he added, was the fact that the pictures were made by photographers flying at a speed of from 125 to 150 miles an hour.

THE FIRST PORTRAIT. A writer in the "Daily Chronicle" states that the first photograph of a living person was that of an Englishman, a well-known civil engineer named Shanks, who, while visiting Daguerre, in Paris, in 1839, suggested to the inventor the possibility of portraiture by means of his process. Daguerre thereupon experimented on Mr. Shanks, and produced the first portrait after the subject had sat still for an hour in full sunshine. Shortly afterwards Daguerre came to England as a guest of the late Lord Avebury's father, and took his first English portrait—a picture of the future peer, then a child of five.

GLASGOW AND WEST OF SCOTLAND SOCIETY OF PROFESSIONAL PHOTOGRAPHERS. The monthly meeting of this Society was held on February 24. Mr. J. R. Brinkley, President of the Society, occupied the chair. The evening was devoted to the discussion of difficulties arising in the course of professional work generally, particularly in the everyday work of the studio. It was open to members to raise any points which they considered to be of interest. The subjects discussed covered a very wide field, and included such divergent topics as professional charges, the preparation of income-tax returns, and dull trade. A committee was appointed to co-operate with the Edinburgh Society in the arrangements for a suggested Scottish Congress to be held in Edinburgh in 1923.

ROYAL WEDDING PHOTOGRAPHS FOR THE U.S.A.—On board the White Star liner "Olympic," which left Southampton for New York on the day after the Royal wedding, was a small barrel, the contents of which were eagerly awaited on the other side of the Atlantic. Specially constructed to float, this cask was packed with films and photographs of the wedding. Off Nantucket the barrel was flung overboard, and picked up by a U.S.A. destroyer, which met the "Olympic" there. The destroyer then made for Boston, and from there the films and photographs were distributed throughout America. By this scheme the cinemas and illustrated Press on the other side were able to present pictures of the ceremony and street scenes a day earlier than would have been possible otherwise.

THE SLUMP IN POSTCARDS. How dearer postage is damaging the hitherto lucrative business of mail carrying is shown in an official statement issued by the Post Office last week. Compared with the year 1920-21 there has been the following falling-off:—Letters, 110,000,000; postcards, 77,000,000; printed papers, 190,000,000; newspapers, 12,000,000. The returns on which these figures are based, however, do not distinguish between picture postcards and other postcards. Compared with 1913-14, before the abolition of the "penny post" and the halfpenny postcard, the falling-off during the present year is estimated at:—Letters, 127,800,000; postcards, 420,500,000; printed papers, 22,300,000; newspapers, 17,100,000. In raising the rates last year the Post Office allowed for a certain falling-off in traffic, but their estimate of an increased yield of £2,500,000 has fallen short by £600,000.

THE METRIC SYSTEM BY EASY STAGES.—With the object of accelerating the introduction of the international metric system, the Decimal Association recommends gradual modification of the existing Imperial system of weights and measures. For instance, it is proposed that the existing table of avoirdupois weights would be greatly simplified, and that closer co-ordination with the metric system would be secured by the present adoption of the following interim table:—7,000 new grains = 1 metric lb.; 16 new drachms = 1 new oz.; 16 new ounces = 1 metric lb.; 2,000 metric lbs. = 1 metric ton. The metric lb. and its parts would weigh about 10 per cent. more than the Imperial lb., and 2 such metric lb. would be exactly equal to 1 kilogram. The suggested abandonment of all the present confusing intermediate denominations of weight between the lb. and the ton simply follow the practice already successfully established in the United States of America and also in some of the British Colonies.

FLEET PHOTOGRAPHIC BRANCH.—The creation of "Fleet photographic officer" and "sloop photographic officer" for the Atlantic and Mediterranean Fleets was announced in "The Times" on January 27, 1920, and officers have since been selected for these appointments. Information is now given in Fleet Orders as to the qualifications for candidates in the photographic branch. Naval ratings and Marines are both eligible. They must have previous experience in photography. Candidates must be recommended by their commanding officers as competent photographers, and must hold no higher non-substantive rating than gunlayer, 2nd class, at the date of application. In the Atlantic and Mediterranean Fleets examinations will be held every six months by the photographic officers, and on other stations names of candidates will be sent home to the captain of the "Excellent," who will arrange for their examinations and will nominate men to fill vacancies as they occur. It is particularly noted that previous experience should include Fleet work, such as triangulation of fall of shot.

DENNISTOUN AMATEUR PHOTOGRAPHIC ASSOCIATION.—The annual general meeting was held in the Club Rooms on the 1st inst. The secretary submitted a very full report of the year's work of the Club, dealing with the enthusiasm of the members, referring to the improved working facilities, and especially to the splendid work of the Rooms Committee, who have been untiring in their efforts to keep the rooms in perfect order for the comfort and well-being of the members. Both the secretary's and the treasurer's report showed the Club to be in a very satisfactory financial condition. On the motion of the retiring president it was agreed that the valuable services rendered to the Club by the hon. secretary be recognised in a tangible form. The principal officers for the coming year are:—President, Mr. James Reid; Vice-President, Mr. A. Robertson; Hon. Secretary, Mr. John Macdonald; Hon. Treasurer, Mr. Wm. F. MacPherson; Librarian, Mr. Wm. Johnston; Lanternist, Mr. A. Shepherd; Exhibition Secretary, Mr. C. Graham.

A NEWSPAPER PRINTED BY A PHOTO-OFFSET PROCESS.—The "Blackpool Times," printed by Messrs. J. Robertson & Co., Ltd., of St. Anne's-on-Sea, was referred to in these columns recently in connection with the printing of the paper by a photo-offset process, which has not previously been done in this country. Two further developments have now taken place which deserve to be recorded. The wedding of Princess Mary was made the occasion for printing in the issue of February 28 two full page illustrations in colour, by a photo-offset process, of the bride and bridegroom. The result is excellent for newspaper work, especially as this is the first time such a thing has been attempted, and no doubt next time colour work is printed a great improvement in the colour rendering will be possible. The illustrations are on the two centre pages, and are bound together by a border across the pages without any joining up. Apparently, three colours and a grey have been used. The issue of March 3 contained a full two-page illustration in black of the wedding ceremony at Westminster Abbey, and the result is eminently satisfactory.

JEFFERY & BOARDER.—A new joining of forces among the firms undertaking photographic and artistic service for photographers has come into operation on the first of the present month in the re-establishment of the firm formerly well known as Jeffery & McLeod as Jeffery & Boarder. Mr. Jeffery, who is fortunate in having had a very wide experience in all branches of photographic work, and who established the present firm more than twenty years ago, makes himself personally responsible for the production of every enlargement or print, and brings to this work the knowledge of many years in the making of the highest grades of bromide and carbon enlargements. Mr. Boarder, an exhibitor at the Royal Academy and formerly the chief artist for Messrs. Illingworth & Co. at Willesden, takes charge of the artists' department, contributing to this side of the business his own skill and taste as a draughtsman, colourist and miniature painter both executively and in the supervision of the firm's staff of artists. We were very interested in recently having the opportunity of examining a large collection of the firm's latest styles in monochrome and coloured enlargements. It would take too long to attempt to describe these in detail, but we may refer in particular to the series to which the title "Dorothy" has been applied. These are enlargements in monochrome, semi-tint, or water-colours, ranging in size from 13½ by 10 inches to 21 by 13 inches, and produced with a die-sunk impression of rectangular, circle, or oval shape, which greatly adds to their distinctive qualities. These enlargements are priced from 30s. down to figures which seem to us astonishingly moderate. The styles are specially designed for portraits of women or children, full length or head and shoulders, taken against light backgrounds. We could not but admire the very high standard of the colouring, and especially noticed the technique of the artists' work in dealing with the dresses of full-length portraits. Choosing only from this series of specimens, any photographer can provide his window at relatively small expense with a display of work which, we venture to think, would inevitably attract a great deal of custom to his studio. We were not surprised to find that Messrs. Jeffery & Boarder constantly receive the thanks of leading London and provincial portrait photographers for the care and skill with which commissions have been carried out. Another most artistic style of enlargement, in crayon and water-colour, is the "Lancaster," also for light background portraits and supplied at the price of 25s. It must not be thought, however, that work in a colour or monochrome finish is exclusively the specialty of the firm. Mr. Jeffery's department sets great store by its work in pure photographic enlarging, and in particular by the remarkable richness of its sepia toned prints and enlargements. Sepia toning has been a special study of the firm from the early days of this process, and certainly the specimens that we saw exhibit the process at its best. We can cordially recommend the newly re-organised firm to those requiring really high-class work.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertoke responsibility for the opinions expressed by our correspondents.*

PHOTOGRAPHERS IN JAVA.

To the Editors.

Gentlemen,—You may be interested to learn that photography as a hobby has during the last few years become extremely popular in this country. Amateur workers are now to be met with in all parts of Java and in the big cities, such as Soerabaia, Batavia, Semarang, Bandoeng and Djocjacarta, the professional photographers themselves do well with their amateur developing and printing departments.

The photographic trade of Java, however, is in the hands of American and German manufacturers. Their goods found their way into this island very soon after the cessation of the war, and an amateur with a British-made camera is very rarely met with.

I have been a traveller in the photographic trade for the past three years, and so far I do not know of any British firm having either a branch or a specially appointed agent to push their goods here.

According to the last census (November, 1920) Java has a population of over 35,000,000, and if the British firms in photographic industry will place their goods in this country I have no doubt that they will find a ready market.—Yours faithfully,

T. H. TAN.

C/o Hotel Sing An Kie, Soerabaia, Java, January 28, 1922.

LEUCO-BASES IN COLOUR PHOTOGRAPHY.

To the Editors.

Gentlemen,—On p. 16 of the "B.J." of January 13 M. Clerc briefly describes as a "New Process of Colour Photography" (F. P. 524,143, 1919, L. Didier) the use of the leuco compounds of certain dyes.

It would be interesting if your valued correspondent would point out the particular novelty in this process, and wherein it differs from the pinachromy process of Meister, Lucins and Brüning (D. R. P. 160.772, 1904; E. P. 4,994, 1904; "B.J.," 1904, Vol. 51, 886, 908: abst. 1905, 73).

M. Didier would use an autochrome negative, thus making use of the principle discovered by O. Gros (Zeits. f. phys. Chem., 1901, 57), that the leuco-bases are specially acted upon by those rays complementary to the colour of the dyes formed.

In the pinachromy process the patentees describe the production of separate constituent images with subsequent superposition, and the production of the one image on a single support, the use of an insulating coat and superposition of the succeeding images in a similar manner. Nitro-cellulose was chosen as the vehicle, as it furnished NO or NO_2. Nitroglycerine, nitrosamine, urea, citric acid, turpentine, anethol, and quinolin are also indicated as sensitisers. Leuco-setocyanin was suggested for the blue image, leuco-rhodamin for the red, and leuco-flavinilin for the yellow. Fixation could be effected with hydrochloric acid plus the sulphocyanides, or monochloracetic or other acids, alum, tartar emetic, benzol, or chloroform, etc.

E. König ("Photochemie," 1906, 60) says:—"Die Pinachromie hat keine praktische Bedeutung erlangt, da die Leukobasen meist zu wenig beständig, die erhaltenen Bilder nicht genügend lichtecht sind. Immerhin ist dieses Verfahren von grossem Interesse, weil es das einzige ist, welches photographische Bilder in verschiedensten Farben durch direkte Beleuchtung herzustellen gestattet." Or, "Pinachromy has no practical importance, since the leuco-bases are generally too unstable, the images obtained are not sufficiently fast to light. Nevertheless, this process is of considerable interest because it is the only one which enables photographic pictures to be prepared direct in the most varied colours."

The process was withdrawn from the market because of the instability of the results.—Yours faithfully. E. J. Wall.

Wollaston, Mass.

ROTARY PRINT-DRYING MACHINES.

To the Editors.

Gentlemen,—We have had our notice drawn to your issue of December 2, wherein you describe and illustrate a rapid print dryer. It is there stated that as far as your knowledge extends print drying machines hitherto on the market are of American manufacture. May we be allowed to draw your attention to the fact that our "Ensign" rotary print drying machine was the first entirely British-made machine, and has been used most satisfactorily for several years.—Yours faithfully,

Houghtons, Ltd.,
A. Catford, Publicity Manager.

February 28.

PRESS PHOTOGRAPHY.

To the Editors.

Gentlemen,—Having a keen interest in Press photography and journalism, and an experience of some 20 years and more in Fleet Street, the quotation you give from "The Journalist" on page 119 of last week's "B.J." calls for some comment.

One is rather surprised at the language used, especially when the writer claims that etiquette (with education) is part of the equipment of Press photographers. The writer is evidently lacking in this, as his expression, "hordes of young duds," etc., is, undoubtedly, devoid of polish and can only be classed as vulgarism. In any case, it is what one would expect to hear at a street-corner meeting and not in the columns of "The Journalist." Now, my experience is that there are plenty of Press photographers in Fleet Street who are well educated and fully equipped with their share of etiquette, and among these a good few juniors.

As one who is keenly interested in Trade Unionism, not sectional but universal, it is very hard exactly to find out what the writer is actually driving at. What does he really want? Has he got the support of the whole of his fellow members? Surely not. It strikes one that he is just a bothead with a sudden spasm of revolt. He tells us the top minimum for Press photographers is £8 8s., and at present there are a goodly number getting this wage. What is wrong, then? We assume some do not get this wage. Has he asked himself the question, "Are they worth it?" We cannot expect any man who has a sense of justice to expect top fees for men that are not competent. The statement that fully-trained men are expected to show a turnover of £120 per month, if correct, proves that things must be booming in Fleet Street, as one can number a good few of the competent sort.

Now, as to the "work-shy" men in Fleet Street—and by the phrasing one is led to assume it means the proprietors. I know most of these gentlemen, and fail to placate one who tallies with this description. Taking the staffs of the agencies all round, workers and principals, I have found most of them keen, alert, and always ready to keep up the status of the profession of Press photography. Of course, there is always one or two exceptions, and I am sorry to say they have been among the workers.

Re the "fifty-fifty" plaint, let me state at once that there are members of the National Union of Journalists who have been glad to avail themselves of working this system when they have been temporarily out of employment, and not new comers to Fleet Street by a long way. No doubt they would again be glad of the opportunity if necessary.

By all means let the Press photographers close up their ranks, but let them be level headed, and state clearly what really are their objects in view.—Your faithfully, "A Worker"

THREE COLOUR CAMERAS.

To the Editors.

Gentlemen,—I should be glad if you would give publicity in your columns to the enclosed copy of letter I have to-day addressed to the editor of the book, entitled "Byepaths of Colour Photography." I think this will cover some of the points raised by Commander Rendall in his review of this publication in to-day's "Colour Supplement" of the "British Journal of Photography."—Faithfully yours,

Aron Hamburger

51, Warwick Street, Regent Street, London, W.1, March 3.

March 3, 1922

Wm. Gamble, Esq.,

Editor, "Byepaths of Colour Photography."

Dear Sir,—I must protest against the further circulation of sundry statements made by the author of the booklet entitled "Byepaths of Colour Photography," as they are calculated to damage me and my associates.

For instance, on p. 33, the author permits himself to remark with reference to compensating devices for colour filters, the following: "The English patent 3872-13 is for 'ether pressure' device' granted to the Dover Street Studios, no application being made for same in the States."

No patent of such number, date and authorship has ever existed. Perhaps the compiler of this extraordinary work refers to British patent in the joint names of Prof. A. E. Conrady and myself, No. 28,722, 1912, to patent No. 1,140,576 granted in 1913 by the United States Patent Office, and the same patent granted at about the same time in Germany, France, Belgium, Switzerland, etc.

Again, on p. 34 the author's comment on the Hamburger-Coston patent of 1903 (for obtaining distorted photographic images) displays truly amazing acumen.

Permit me to inform you that this patent referred merely to a method of preparing photographic prints on fabric, of humans, and other animals, which when stuffed with a suitable stuffing would become available for use by children for rag dolls.

As there was no other or hidden meaning in the specifications than this, I cannot conjecture why it is dragged into what purports to be a dissertation on colour photography.

Furthermore, I find this book "stuffed" with other irresponsible and inaccurate statements.

Page 38, for instance, talks of a "curious but scientifically correct self-compensating action," etc., patented by O. Pfenninger.

Had not the book gone on to say "it is interesting to know that this is the camera which Dover Street Studios used in 1911-13 in taking successfully by instantaneous exposures three correct colour negatives, etc.," and had he not described a Polychromide printing process which I, the inventor of the Polychromide process, cannot recognise as anything like work of mine, I could have passed over the description of the Pfenninger camera without comment. The facts are as follows: When the Dover Street Studios were under my control we spent time and a considerable amount of money in many utterly fruitless attempts to take photographs in natural colours with O. Pfenninger's soi-disant colour camera. Before we discarded it, it certainly proved to be "curious, even

if we could not see visible evidence of scientific correctness" in any of its performances.

It is, therefore, indeed interesting to know that this is the camera which Dover Street Studios used in 1911-13.

As it certainly is not the camera used at the Dover Street Studios, where the Hamburger-Conrady instrument (which I still use) made every photograph in colour on paper which was ever shown by the Dover Street Studios, this statement might be accepted seriously by readers of the booklet who do not know Mr. Pfenninger and his camera.

I must, therefore, request that a correction of this and of the other inaccuracies previously pointed out to you, be attached to such copies of this volume as may be further offered for sale, and also, as far as possible, sent to previous purchasers..—I beg to remain, faithfully yours,

ARON HAMBURGER.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

M. G.—As you state that an improvement in covering power resulted from turning the lens round we must accept it as a fact which is, however, very difficult to explain. It might be due to a loose glass falling into position when the tube was turned, or to some want of accuracy in the camera which was corrected unknowingly in the process.

W. G. R.—Small plaques can be made from ordinary negatives by sensitising a thick film of gelatine with bichromate of potash, printing in the ordinary way and swelling the gelatine until the maximum relief is obtained. A plaster mould is made from the wet gelatine, and in this a plaster or metal plaque may be cast. So far the results obtained have had no commercial value, only profiles being at all satisfactory.

S. G. E.—It would seem to us that you can easily ascertain whether you have enough light for your purpose by the simple process of taking a negative. From our own experience we should imagine that at least double the candle-power would be necessary to give a properly exposed negative in one-tenth second. You do not mention diffusers or reflectors; these, of course, would have an important effect upon time of exposure.

S. J. A.—"The Air-Brush in Photography," by G. F. Stine, is published by the Abel Publishing Co., 421, Caxton Building, Cleveland, Ohio, U.S.A. We do not think the other book to which you refer is published in English, but No. 181 of the "Photo-Miniature" is devoted to "Air-Brush Technique," and if still in print can be obtained from Messrs. Houghtons, Ltd., 88-89, High Holborn, London, W.C.1, price 1s. 8d.

W. R.—Nothing is better to soften the light than starch made as for mounting with a little whiting mixed in. This is laid on thinly and stippled with a dry brush till even. The thin tracing paper, called papier mineral or waxed paper, as used for wrapping plates and paper, will answer the purpose well. Use casement cloth for dark curtains and nainsook or madapolam for the white ones. For roller blinds you must use the proper blind holland in suitable colours.

S. J. P.—So far as we know, materials for making bas-relief photographs are not on the market, nor have instructions been published outside of the many now somewhat old patent specifications for the production of this effect. As you say, most of these processes consist in taking a print on a pure, strong paper, such as platinotype, and pressing it from the back either with a blunt tool by hand, or by making some kind of die in lead or plaster of Paris, the pressed-out print being afterwards filled up from the back with a plastic mixture so as to cause it to retain its shape.

B. F. E.—Practically every operator has his own ideas as to spot lighting, but, as a general rule, it is obtained by placing a small arc or a 500-c.p. half-watt lamp fitted on a suitable shade where it will produce the desired effect, the lamp itself being, of course, concealed. You can get a lamp ready fitted up from Marion and Co. In the U.S.A. a half-watt lamp is often used fitted into a metal box with a condenser, like the ordinary limelight box on the stage, but much smaller. This enables a beam of light to be thrown in any direction from some distance. Little can be done with daylight, although an ordinary mirror can sometimes be used effectively to produce a small, bright light.

A. W. S.—If your inclinations are to the artistic rather than to the scientific aspect of photography, there seems no reason why you should not succeed as a portraitist. At your age it is not likely that any photographer would take you as a pupil. Probably your best plan would be to get in touch with the Polytechnic School of Photography, Regent Street, London, W.1, where you could receive a thorough training in every detail of professional work. It is just possible that you could obtain a grant in aid of your training from the Government. There was a scheme known as O.13, under which a number of ex-officers have been trained there. The complete course is 39 weeks, daily from 10 to 4.

A. G. W.—The arrangement used for photograph No. 2 is quite correct. That in No. 1 is wrong, as you are too far from the light, and the lighting is necessarily flat. There are many points at which you could place the sitter between position 2 and the window, and also many positions for the camera. In such a room you could get good fancy lighting and Rembrandt effects by placing the sitter so that the profile or narrow side of the face is illuminated directly, and the shadow side by a reflector. If you instal half-watt lamps, three of 1,000 c.p., fixed just above the window, about 2 ft. into the room, would be useful. These could be used with daylight for full lengths, or lowered to about 6 ft. for sitting figures at night.

M. W.—You seem to have acted in a very unbusinesslike way in refusing to send proof. It is an arguable point whether the customer is justified in cancelling the order because you refused to send him proof but insisted on his coming to your premises to see the proof. Although the point is a little doubtful, we are inclined to think that a County Court Judge would very likely say that the customer was perfectly justified in cancelling the order in view of such an unreasonable attitude on your part. However, that is somewhat beside the mark. Having received the order and accepted it from the customer, you have no right whatever to print post-cards for yourself, whilst, on the other hand, the customer has every right to have the photograph copied, sell copies to his pupils—in fact, to do just what he likes with them. Your remedy is to sue him for the amount of the order, but we are afraid that, in view of the peculiar policy you have thought it fit to follow, you stand a poor chance of getting ordinary justice.

The British Journal of Photography

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. PRICE FOURPENCE

TERMS OF SUBSCRIPTION POST FREE.

UNITED KINGDOM OR CANADA.—*One Year*, £1 1s. 8d.; *Six Months* 10s. 10d.; *Three Months*, 5s. 5d.

ANY OTHER PART OF THE WORLD. *One Year* ..... £1 3s. 10d. *Six Months* ... 12s. 0d. *Three Months* 6s. 0d.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high prices prevailing for everything in connection with newspaper production prohibits the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

HENRY GREENWOOD & Co., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3228. Vol. LXIX. FRIDAY, MARCH 17, 1922. Price Fourpence.

Contents.

SUMMARY.

Blocking out can be protected against scraping by covering with thin gummed paper or varnishing. This is but one of the many useful hints given by a contributor, who deals fully with the subject of blocking-out negatives in a practical article on page 151.

In a leading article we discuss the use of various reducers for remedying over-printed bromides, and describe the method of using the most satisfactory of them. (P. 150.)

Dr. B. T. J. Glover's valuable contribution on the contrast rating of bromide and gaslight papers, which attracted so much attention at a recent meeting of the Royal Photographic Society, will be found on page 156.

One of the many problems assigned to the photographic department of the Eastman Kodak Company's Research Laboratory is the working out and testing developing formulæ. Some methods of testing adopted by the Laboratory are given in a communication from the company on page 153.

Users of tanks for the development of the ultra-rapid grades of plates now coming into general use would do well to bear in mind that such plates need longer development (or stronger tank developing solutions) than the slower varieties. (P. 150.)

Mr. W. L. F. Wastell was duly elected President of the Royal Photographic Society on Tuesday last. A brief report of the annual meeting, with the names of the newly elected Vice-Presidents and Council, and a portrait of the new President, will be found on page 160.

The Council of the Professional Photographers' Association report a very successful year of working. The new members number 126, and there have been few resignations. (P. 159.)

The death is announced of Mr. Alexander Cowan, once a well-known worker in the world of photographic chemistry, and for many years connected with the house of Messrs. Marion. (P. 159.)

Ladder tripods are not used in this country to the extent their usefulness deserves. A very simple and portable pattern, devised by an American worker, is described on page 150.

Professor R. Namias, of Milan, recommends a method of intensification designed to produce a degree of density much greater than is commonly required. (P. 149.)

The South London Photographic Society have revived their "annual" exhibition after an interval of eight years. (P. 161.)

Mr. Marcus Adams and Mr. A. C. Banfield, both professional photographers, are two of the six new members elected to the Council of the Royal Photographic Society. (P. 163.)

EX CATHEDRA.

Dr. Rodman. While making, as we do on another page, a but little-needed introduction of Mr. Wastell as the newly-elected president of the Royal Photographic Society, we must take the opportunity of paying a tribute to his predecessor who retires after two years of undivided service. Among his many qualities, Dr. Rodman has that of optimism. Like Mr. Arnold Bennett's "card," he is "identified with the great cause of cheering us all up." This gift has been liberally bestowed in the public and private meetings of the Society, and has certainly been effective in dispelling what Mr. Wratten once called the "cathedral atmosphere" of the Royal. Moreover, to the conduct of the Society's affairs Dr. Rodman has applied a constant and tireless energy, witnessed, for example, in the consecutive series of house exhibitions, in the linking of the Society with allied Associations, no less than in minor matters of furnishing and equipment. He has, in short, got many things of advantage to the members accomplished by his individual effort and undeniable solicitation. The vociferous character of the vote of thanks at Tuesday's annual meeting did not unduly emphasize the appreciation of these labours and the personal esteem which Dr. Rodman carries with him on his laying down the cares of office.

* * *

Extreme Intensification Professor R. Namias has recommended a process of intensification suitable for the utmost degree of intensification and contrast such as is required in rendering visible traces of impressions obtained in the photography of suspected documents. The negative is first bleached in a bath of two parts potass permanganate and 20 parts hydrochloric acid in 1,000 parts of water, rinsed and developed in ordinary M.Q. The object of this treatment is to yield an image specially susceptible to intensification. The negative is then bleached in the usual bath of mercury bichloride and darkened with a developer. Next follows treatment with a bath of mercuric iodide compounded from two stock solutions:—(a) Mercury bichloride, 3 parts; hydrochloric acid, 1 part; water, 100 parts; and (b) potass iodide 5 parts; water, 100 parts. Solution (b) is added little by little to solution (a). A red deposit of mercuric iodide is first formed, the addition of (b) being continued until the mixture just becomes clear. On treating the negative, which has been intensified with mercury and well washed in this mixture, the progress of further intensification can be followed by transmitted light. The action of the bath is stopped as soon as it is seen that no further increase in density is taking place. If a still greater degree of intensification is desired, the negative may be subjected twice in succession to the treatment with the plain mercury bleach and re-development, but once the plate has been acted on by the mercury iodide mixture it is not susceptible to further chemical treat-

ment. It may reasonably be thought that it has not done so badly as intensifiers go, in this respect; but Professor Namias explains that the process is designed for a degree of intensification greater than is commonly required. Moreover, as the intensified image is a brown colour, still further contrast may be obtained from the negative by printing it through a violet screen such as may be made by soaking a fixed and washed plate in 1 per cent. methyl blue solution.

* * *

Wasted Retouching. The modern practice of sub-dividing labour in the production of portrait work often causes a serious waste of time, by reason of the workers in one department not understanding the requirements of those in another. Nowhere is this so apparent as in retouching, the retoucher, who has usually learned no other branch of the craft, having little idea as to the printing value of his, or her, work. This can be remedied to a great extent by taking a rough proof of the negative, and judging from it what retouching is really necessary, instead of working up to a uniform standard of smoothness. We have noticed that single-handed workers who carry the whole production through put very much less work upon their negatives than is found upon those retouched in the ordinary way. It is not suggested that it would be necessary to continue the practice of working from proofs after the retoucher was trained to see what was really necessary. There is, of course, the natural instinct of self-preservation on the part of the retoucher to be considered, but, as a rule, the time saved could be usefully employed in other ways, so that no immediate reduction of staff would be necessary. Another point worth considering is that the loss of likeness, so often due to over-touching, is practically eliminated.

* * *

Ladder Tripods. There are few outdoor photographers who have not felt the necessity for a very high tripod stand, by which they would be enabled to clear the top of foreground objects, such as walls, garden hedges, and the like, or to get more comprehensive views of factories and church interiors. So far, the only arrangement available has been made on the model of a pair of household steps, and this is too heavy to be transported, except by a special vehicle. An American photographer has devised a much more portable and simple stand, which many of our readers might be glad to copy. It consists of a tripod between seven and eight feet in height, of which the back leg is a light ladder, the other two being of the ordinary pattern, or even single poles. All the legs are made to fold, and the whole can be packed in a bag and carried either in a cab or, for shorter distances, by hand. It is, of course, necessary to provide a tilting top, so that the camera can be adjusted while the operator is upon the ladder, and it is also well to have stops or discs to prevent the legs sinking into soft ground. The top should be of generous dimensions, so that the operator can stand in a position to focus and insert his slide safely and conveniently.

* * *

Tanks for Rapid Plates. An idea, common to many operators, is that extremely rapid plates must of necessity give thin negatives. This is quite erroneous, as it is possible to obtain extreme density if the development be thorough. Using what may be termed a normal developer, it will be found that nearly twice the time necessary for a slow plate must be given for the ultra rapid grades now coming into general use. Development may be expedited by increasing the quantity of alkali or by raising the temperature of the solution, but these courses are not to be recommended, as there is then a tendency to block up detail in the high lights. As the prolonged development necessary with a normal developer means a serious loss of time when a large number of exposures have to be dealt with, it is advisable to adopt the tank system, by which a couple of dozen plates can be developed in the time necessary for a quarter the number done in dishes. It is not necessary to use extremely dilute solutions for tank development, a strength which necessitates an immersion of twenty minutes being most convenient. Most tanks are rather wasteful of solution, the grooves being too wide, and there being space wasted at the ends and sides. The racks should fit the tank, and each groove should hold two plates back to back, thus allowing ample room for solution between the film sides. It must not be forgotten that pyro soda is as good in a tank as in a dish.

OVER-PRINTED BROMIDES.

THE best way to deal with over-printed bromides is to consign them at once to the waste box and correct the error by a fresh exposure. But it is not always convenient to do this, the fault only being discovered when the prints are dry, and then at a time when printing or enlarging is not practicable. Moreover, if the print is fairly large, the cost of the paper is a consideration, and it is worth while trying to save it.

The most obvious way of doing this is to employ one of the standard reducing solutions, as used for negatives, of course in a highly-diluted state, as the delicate image of the print would be quickly dissolved if a strong solution, as is used for negatives, were applied. Bleaching-out the image and re-developing has found some advocates, but in our experience the results so obtained have not been comparable with a print properly exposed in the first place, the effect being that of an over-exposed and under-developed print, if the development has been cut short, while practically a return to the original state comes with full development. A process of reduction, if carefully carried out, offers the best chance of success, and should not affect the colour of the deposit.

There are several formulæ which are suitable, but none which will bring very dark prints to a normal depth, as these are apt to become harsh under treatment. We therefore assume that only a moderate degree of reduction is necessary.

Before going farther it is worth remembering that a strongly-acid fixing bath, especially one fairly charged with amidol developer, has a considerable power of reduction, so that if dark prints are left in it for half an hour or more they may be lightened to the desired degree. This action is not equally strong upon all brands of paper, so that experiment is necessary before relying upon it.

Of the standard reducers there is none so satisfactory as a mixture of iodine and cyanide, which works evenly and does not affect the colour of the image. In deciding upon a working strength, we have here also to study the nature of our paper, or we may find that our image is damaged beyond reparation before we can stop the action. Two stock solutions should be prepared, one being a ten per cent. solution of iodine in iodide of potassium and the other a ten per cent. solution of potassium cyanide. The normal reducer for negatives is made by adding thirty minims of the iodine solution and five minims of the cyanide to each ounce of water. At this strength it may be used for cleaning up margins, or for quickly removing any unwanted portions of the image; for general reduction it should be diluted with two or three volumes of water. It should be noted that the energy of this

reducer depends upon the iodine which converts the metallic silver forming the image into a salt which is readily soluble in the cyanide, so that increasing the strength of the cyanide has little effect. The solution may be used in a dish, but in practice it is more convenient and economical to lay the print upon a glass plate or the upturned bottom of a porcelain dish, and to apply the reducer with a swab of cotton wool. By so doing, not only can a certain amount of local control be exercised, but, as only a small quantity of solution is present, there is little risk of running over the desired point. Five minutes' washing is ample after using this intensifier.

The well-known ferricyanide and hypo solution may be used in the same way, care being taken that only enough ferricyanide be used to give a very pale yellow colour to the mixture. The hypo may be rather stronger than is sometimes recommended, a ten per cent. solution being a good working strength. A plain, non-acid hypo bath must be used, and the ferricyanide should be freshly dissolved. These precautions will obviate the stains which sometimes occur. If used in a strong light the mixed solutions rapidly become decolourised and inert.

A convenient method for use with large prints is that of successive immersion in a weak solution of iodine and hypo solution. To enough water to cover the print well is added the aqueous solution of iodine, previously mentioned, until a deep straw tint is obtained. The print is laid in this, and the dish rocked until the blue colour, which immediately appears on the back, is visible in the high-lights of the picture. After rinsing, a twenty per cent. hypo bath is applied, and allowed to remain for at least ten minutes. If the reduction be insufficient, the whole process may be repeated, after thoroughly washing, any trace of hypo being sufficient to stop the action of the iodine.

Prints which have been toned by bleaching and sulphiding, or which have been thoroughly toned with hypo-alum or liver of sulphur, can be reduced with the iodine-cyanide solution, but as a rule the tone will be rendered rather warmer. A much stronger solution may be used than is permissible with black-and-white prints.

The semi-mechanical reducers which act by dissolving a portion of the gelatine film, such as eau-de-javelle or Milton, do not work well upon bromide prints, no matter how weak they may be. They have a tendency to remove the deposit entirely from the high-lights, and to give a harsh, patchy effect.

When contrasty effects are desired from thin negatives, it is sometimes advisable to over-expose deliberately, to over-develop, and then to "clean up" by one of the methods given. This is especially valuable with line subjects which have a tendency to print through. Quite a deep grey tint may be removed and the lines still left of greater depth than would be possible with simple exposure and development.

We have lately handled some samples of paper which did not allow of the film being rubbed with cotton wool while wet. If such are encountered, the reduction must, of course, be carried out by immersing the print and keeping the dish well rocked.

BLOCKING OUT NEGATIVES.

Blocking out is not so difficult an art as retouching, yet really good hands at blocking out are not often met with, even expert retouchers sometimes being unable to block out a negative in a convincing manner.

A negative that has been correctly blocked out will print as though it had been taken against a white ground, and will deceive the uninitiated always and sometimes the expert also, and this kind of blocking out is the only kind that matters.

The essential tools for this work are a couple of good sables, some water colour, a knife, and some cottonwool or washleather. A common mistake is to choose a very fine brush. A stout short-haired sable is essential, and its size should depend on the detail of the negative. For a half-plate head a No. 3 or 4 sable will not be too large if the point is good. For machine studies, smaller brushes may be needed for very fine detail, but should not be used otherwise. For filling up, a large camel-hair mop will save time, while a stencil brush is useful for softening outlines of hair, etc. Indian red paint and Payne's grey or neutral tint are very useful, though Photopake can be used instead of the red if desired. For commercial negatives a short steel straight-edge, a draughtsman's "curve," and a ruling pen are also wanted.

The first thing to do is to see that brushes are clean and in condition, that the paint is mixed well and of a good consistency, and that the negative is clean. It is always a sound plan to go carefully over the surface to be painted on with a damp leather or swab of wool, as the slightest trace of grease or other foreign matter may spoil the job completely. With glass negatives it is usually best and easiest to work on the glass side (this does not apply to commercial photographs), as this side will always clean quickly and take paint well, besides giving diffusion in printing. Exceptions are large negatives of "indented" subjects, such as full-length groups. Blocking out on the glass side of such pictures may prove difficult, if not impossible, to do in such a way that it will everywhere print in correct register with the image. With single figures it very seldom happens that this difficulty crops up provided the work is done with the eye directly over the centre of the figure all the time, and the negative is kept flat on the desk. This latter, by the way, is as well lowered rather more than is usual for retouching, though that may be a matter of taste. When the rule and pen are used, however, the more the desk approaches to the horizontal the better.

Having decided which side of the negative to work on, the brush is loaded and brought to a point. For all definite outlines red paint is the best. For hair and other soft lines blue or grey is better. With the negative on the desk a line can be started off at any point on the side against the brush hand. In the illustration the first operation is marked out in black with arrows showing the direction of the different strokes used. With this negative glass side up, and right way up on the desk, a convenient point for a right-handed worker to start would be where the hair joins the neck. From there a bold sweeping line is drawn downwards, following the outline of the neck, beads and blouse. Had the latter two been prominent breaks in the flow of the line, one sweep would not have served. The procedure then would have been more like that for the bottom line of the back hair, which was done with a number of distinct strokes; in this case, back-hand ones. Turning the negative half round to the right, so that the top comes against the brush, the stroke A is put in back-hand, and the various top curves with separate up-and-down strokes, following the direction that is most convenient in each case. Wherever there is a definite corner, it is always

best to start outwards from it. Don't run into it, and, above all, don't run over it and continue without a break. Outlines like these are best done in definite sections, each section meeting its neighbours in a clean join. Turning the negative upside down, the tip of the nose offers a good starting place. From there, working downwards, three decided sweeps will join up with the part just done. But they must be decided sweeps, particularly the line on the nose. Any hesitating, creeping, niggledy line here would ruin the resemblance, the blocking out, and the photograph. With the negative turned yet a little more, the mouth is covered with three short curves, done backward in this case, though downward strokes might be easier at first. The line between the chin and shoulder is composed of two lines, one done with the face of the picture looking down, and the other with the negative turned the other way up. The heavy sweep on the arm is started from

Print from partially blocked-out negative illustrating method of working.

the margin and run to the bend of the shoulder, where a backhand stroke, which could also have been done in the other direction, joins it to the line from under the chin.

Having completed the outline, it is examined for inaccuracies, any small deflections from the truth, unless done deliberately with the object of improving the shape of the head or features, may possibly be remedied without washing out and re-doing. A raggy outline of hair may be improved with a smudge of blue or grey paint well stippled with the stencil brush, though it is difficult to do this so as to get a good effect on the print. If the paint has gone too close anywhere, it can be eased away with a clean damp brush if on the film side, or a sharp knife if on the glass. With the outline correct, it is a simple matter to fill up with a large brush or mop, but the paint should be fairly thick, and a coat on each side will do no harm. If drying is required to be quick, spirit should be added to the paint instead of water when mixing for use.

Commercial negatives, of furniture, machinery, etc., are best done on the film side, as it is easier to rule clean straight lines on this side. A little practice may be necessary to get into the way of handling a ruling pen, but it is not at all difficult. A good load of paint should be taken up between the points, and its consistency is important. If it is thick, the extreme point will soon clog. If it is thin there will be a danger of blotting from the edge of the rule. A common trick with draughtsmen is to draw the pen over the back of the hand, the skin being able to start the flow more readily than even paper will, and much more readily than gelatine often does. Once started, the paint will flow until the pen is empty, provided it is not put down for long enough to let the point dry. In drawing a line with the pen, one should aim at starting and finishing one-sixteenth of an inch short. In this way the complete line is cleanly covered, as a rule. If there is anything short, it can be easily filled in after; but an over-run is hard and messy to clean out. When it is necessary to clean off a line, it should be done with a clean, sharp "swipe," with a wet leather or swab, starting from inside and clearing the paint over the unwanted part of the negative. Curves are often done freehand, but wheels are rather hard to do cleanly without guides, and the "draughtsman's curve" will assist very often in getting a more definite line. These "curves" can be bought in an endless variety of shapes, and a good one will provide guidance for a large number of bends and corners. A little practice is necessary before one can use a curve with confidence; it is rather hard to keep the pen point parallel to the curve all the way round, the resulting line often being clean enough but not exactly in register.

To finish off a blocked-out negative, it is necessary to make some allowance for the base of the picture. A blocked-out figure cannot be left to stand on nothing, neither can a blocked-out railway engine. The former can be put right by scraping away some of the paint round the shadow side of the feet, preferably in zig-zag lines. The engine would look all right if a length of line were left under each side of wheels, and a stationary machine or piece of furniture should have a little flooring left in the form of a square, not forgetting the perspective when designing the square. Of course, if an air-brush is in use, grounds can be put in on each separate print, but when the photograph can be taken on a clean and light floor, the original ground has advantages, and should be partially included, leaving just enough to give stability to the picture. For block-making purposes, a photograph can be completely blocked out and the ground left to the fancy of the block-maker's artist if desired.

Forethought helps a lot with machine and furniture photographs, and if a sheet is stretched behind the object before photographing, the subsequent work will be easier. A print made previous to blocking out will also help. It is almost essential in the case of a machine photographed with other machinery behind it. Very fine detail, such as electric wires, is very difficult to block out, and very often it is best to paint it over entirely and restore it with a sharp knife when the paint is quite dry. The most difficult thing I have ever struck of this kind, is the wiring of an O.E.T. crane, it being impossible to block it out or to recut it decently. In this case, I think the most satisfactory way is to paint over all the wires, leaving the insulators distinct, and to draw in the wires with a retouching pencil on the prints. If technical accuracy is necessary, a blue print of the wiring can be requisitioned to make things clear and prevent a wrong number of wires being added. Another dodge which has proved useful is to do any long straight lines with strips of lantern-slide binding, instead of using the pen. In the case of a piano

this may prove quicker and easier, if the round corners are carefully tackled with the brush.

Blocking out can be protected against scraping by covering with thin gummed paper, or varnishing. Without either of these coverings a negative must be kept in a tissue envelope or it may soon meet with damage or else damage other negatives with which it comes in contact.

THERMIT.

PHOTOGRAPHIC METHODS OF TESTING DEVELOPERS

[A communication from the Research Laboratory of the Eastman Kodak Company, reprinted from the "American Annual of Photography." The Elon mentioned, it may be stated, is metol (monomethyl paramidophenol sulphate) of Eastman manufacture.]

One of the many problems assigned to the Photographic Department of the Research Laboratory of the Eastman Kodak Company is the working out of better developing formulæ, which involves the testing of developers submitted from outside sources. Years of experience in this connection has shown that only a surprisingly small number of different developing formulæ are necessary to develop every type of emulsion successfully, and that in spite of the numerous developing agents of varying chemical composition at present available, pyro, Elon, and hydroquinone still remain unequalled, though para-amidophenol, glycin, methyl-o-amidophenol, and diamidophenol are useful for special purposes.

Instead of adhering strictly to the manufacturers' published formulæ, almost every photographer has his own pet formula with a reputation in many cases entirely undeserved, because the formula was not compared with the manufacturer's formula under equally favourable conditions. These remarks apply also with regard to developing agents. Some photographers use developing agents of unknown composition with supposedly mysterious properties, although careful comparative tests would undoubtedly prove that the developing agents in question are no better than the standard known developers.

In this article it is the object of the author to explain how by simple tests the photographer may judge the merits of any developing agent or developing formula with accuracy.

Two methods of testing are possible:

1. The absolute method, by means of which the various properties of a developer are expressed numerically, and

2. The comparative method, whereby the developer to be tested is compared side by side and under identical conditions with a standard developer.

The first method is obviously the ideal one, because if we can measure the properties of a substance and express them in numbers, then we really know something about that substance. Without the necessary apparatus, however, it is not possible for the photographer to express his various tests numerically, but by comparing a developer side by side with a standard, he is usually in a position to judge the merits of the developer with sufficient accuracy for all practical purposes.[1]

Classification of Developers.

In photographic practice, the word "developer" is used synonymously with a developing agent, a complete developing solution ready for use, and a developing formula, so that developers may be classified as follows:

1. Developing agents.
   - *a.* Composition known.
   - *b.* Composition unknown.
2. Developers ready for use.
   - *a.* Composition known.
   - *b.* Composition unknown.
3. Developing formulæ.

1-*a*. In order to test a developing agent of known composition, say hydroquinone, it should be compared with a known pure sample of the same developing agent by compounding a standard developing formula with both chemicals and then comparing the two developers so obtained.

A suitable standard developer formula is the following:—

	Metric.	*Avoirdupois*
Developing agent	5 gms.	75 grs.
Sodium sulphite (E.K. Co.)	50 gms.	1¾ ozs.
Sodium carbonate (E.K. Co.)	25 gms.	375 grs.
Potassium bromide	1.5 gms.	20 grs.
Water to	1 litre	32 ozs.

1-*b*. A developing agent of unknown composition is compounded according to the above formula and compared with a known developing formula used for average work. Such a developer, known as MQ-25,[2] is prepared according to the above formula, using 1.25 gms. of Elon and 3.75 gms. of hydroquinone as the developing agent.

2. A ready-made developer is compared with MQ-25 or with a known satisfactory developer.

3. The behaviour of a developer prepared according to a new formula is compared with that of the best previously known formula for the particular purpose in question.

The Emulsion to be Tested.

Since the behaviour of a photographic material towards developers is usually independent of the support on which the sensitive emulsion is coated, we will refer only to the action of developers on emulsions.

We cannot comprehensively speak of the properties of a developer without referring to the emulsion which is developed, and, *vice versâ*, when speaking of the properties of an emulsion, we refer to them in connection with a particular developer.

Most developing formulæ are particularly adapted for particular classes of emulsions, and should be compared on representative emulsions in such classes as follows:—

Negative emulsions	NC film. Commercial film. Process film.
Positive emulsions	Positive motion picture film. Seed Lantern plates.
Paper emulsions	Velox. Bromide and Artura Iris.

Mixing the Developer.

When compounding test developers from the solid developing agent, it is important to weigh out the various ingredients very carefully in order to insure an accurate comparison. Instead of weighing out small quantities of potassium bromide it is more accurate to measure out the required volume of a 10 per cent. solution.

Since a developer which gives bad chemical fog is useless, and since more developers are rejected on account of fog than for any other defect, it is important that the rules of mixing developers be carefully observed so that no fogging agents are produced during mixing. As a general rule, the sulphite should be dissolved first, each chemical thoroughly dissolved before the next one is added, and the developer mixed at as low a temperature as possible, otherwise the developer will give fog even if prepared from the purest chemicals. A report on a developer incorrectly mixed is absolutely worthless, because there is no way of telling whether the fog was inherent in the developer or was a result of incorrect mixing.

To mix the above test formula given above proceed as follows:—

Dissolve the sulphite in about 300 ccs. or 10 ozs. of luke-warm water; then add the developer hydroquinone or both, and allow to cool. Meanwhile dissolve the carbonate in 300 ccs. of luke-warm water, add the bromide and cool. Now add the carbonate solution to the sulphite solution and add cold water to make 32 ozs. or 1 litre.[3]

1. Chemical methods of testing developing agents have been fully described by H. T. Clarke ("Jour. Ind. Eng. Chem.," Nov., 1918

2 The suffix ... per cent. of the total developing agent consists of ... Simplified Method of Writing Developing Formulæ ... K. Metol ... "B.J.," 1917, p. 535.

3. See "How to Prevent Photographic Solutions," by J. I. Crabtree ("B.J." ... Chemical Fog" ("Amer. Ann.," 1919, p. 20).

Sensitometric Methods.

When we expose a plate or film in a camera focussed on a landscape, we impress upon the emulsion areas of light of varying sizes and of varying brightness. After development the negative consists of areas of varying sizes and varying opacity or density, the relation of the density of a given area to the intensity of the light producing it for the particular emulsion depending upon the developer and the time of development.

The density of any particular portion of a negative is a measure of its capacity for stopping light and is proportional to the total mass of silver comprising that portion. It can be measured by chemical analysis, but much more readily by an optical instrument by comparison with a standard density. In the case of an average amateur negative the density of the shadows will average 0.25 to .04 and the density of the high-lights from 1.2 to 1.8. One way of comparing the behaviour of two developers is to expose two films in a camera on the same subject, giving the same exposure, develop them side by side and compare the densities of corresponding areas of the shadows, middle tones and high lights of the resultant negatives. This method is not entirely satisfactory because very few areas of uniform density are large enough to permit of measurement, and it is not possible to place any two areas which received the same exposures side by side so as to compare the densities visually.

It is much more simple, therefore, to expose a negative in steps of gradually increasing exposures so as to correspond with the shadows, middle tones and high-lights of a subject and use these graded test strips in place of actual camera-exposed films because the developed strips may be placed side by side and a comparison made of the densities of steps which received identical exposures.

How to Expose a Step Negative.

When measuring the characteristics of a developer in absolute units, it is necessary to use a standard light-source and a special rotating disc or drop shutter for obtaining the graded exposures, but for comparison purposes it is simply necessary to give the test emulsion about six different steps in exposure, the lowest step being given such an exposure that after development the step will be just visible. The exact ratio of the exposures of the various steps is not important but should be of the order 1, 2, 4, 8, and 16.

To prepare a number of test strips, proceed as follows:

Take a 7×5 or 10×8 sheet of the film coated with the particular emulsion to be tested, place in a printing frame, and cover with an opaque card. Now, make a preliminary test to ascertain the distance from the exposing light so that an exposure, say of two seconds, is required to produce a just visible deposit on the film when developed in the standard developer for an average time. Then place the frame containing the sheet of film to be exposed at this determined distance from the light source, and shift the card so as to expose a strip of the film in the frame for 16 seconds. Then expose new steps after the expiration of 8, 4, 2,

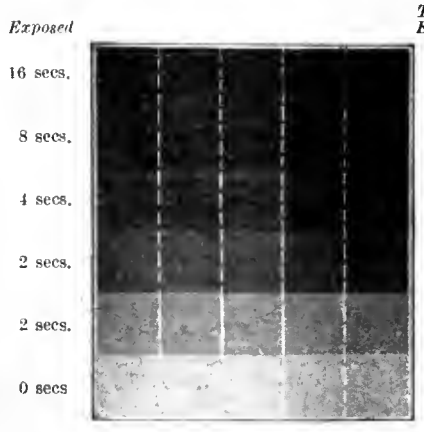


Fig. 1.—Method of exposing test film and cutting into graded test strips.

and 1 seconds respectively. The last step should be unexposed so as to serve as a fog test strip. The various steps have, therefore, received exposures of 0, 2, 4, 8, 12, and 32 seconds respectively (fig. 1). Now, cut the film lengthwise along the dotted lines so as to give a number of graded test strips.

A quicker method than the above, if a large number of test strips have to be prepared, is to expose a 10×8 or 7×5 sheet of film as above, and develop this without cutting along the dotted lines. This graded strip negative can then be used as a master negative for printing test strips, the printing exposure being so adjusted, as described above, that the least exposed step is just visible after development.

For purposes of comparing developers, the exact ratio of the exposures for the various steps is unimportant, though it is not advisable to make the ratio of successive exposure steps greater than the power of 2.

In some cases it is sufficient to make comparative tests on strips of film which received only one step in exposure, which are known as "flashed strips." To prepare a number of flashed strips expose one half of a large sheet of film so that after development the density will be a little less than unity. This would correspond to a middle tone of an average negative, and objects should be just visible on looking through the flashed half of the developed film. The unexposed half serves for the fog test. The large sheet should then be cut lengthwise so as to give a number of test strips which all received the same exposure.

The Use of Graded and Flashed Test Strips.

Flashed strips give only a comparative measure of the maximum density produced by the developers. When comparing two similar developing agents for purity or when comparing contrast developers, flashed strip tests usually supply all of the information required. If developers are to be compared for detail rendering power and for contrast, then graded strips should always be used.

How to Interpret Test Strips After Development.

After development the graded test strips will appear as in fig. 2. The lowest step, *a*, is a measure of the fog produced by development, since this step did not receive any exposure.

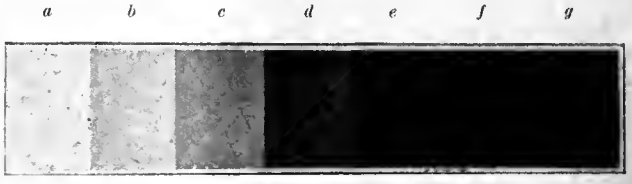


Fig. 2.—A step negative as it appears after development.

Always think of the first step, *b*, and the last step say, *g*, as corresponding to the shadows and high-lights in the subject photographed, the intermediate steps corresponding to the various tones of the subject. The density of *b* is a measure of the detail-giving power of the developer, while the difference between *g* and *b* gives the density contrast. In the case of developers required to render a minimum exposure, say for high speed photography, the difference in density between *a* and *b* should be as great as possible with enough difference between *b* and *g* to give a sufficiently contrasty print, but with a developer intended for, say, line work, the density of *a* should be as low as possible; that is, the developer should be free from fog, while that of *b* and *g* should be as great as possible.

Factors to be Considered when Comparing Developers.

An ideal developer is one which will develop rapidly, give good contrast and shadow detail without producing chemical fog, and which will deteriorate only slowly; that is, if it has good keeping qualities. Other factors are of less importance. The specifications of ideal developers for various purposes, of course, differ. For instance, if the most is to be secured from an under-exposed negative, it should be developed in a tray with a developer containing caustic alkali, this developer keeping active for only a very short time. In the case of amateur finishers' and motion picture film laboratories, a developer is required which will develop a normally exposed negative in from 5 to 15 minutes, but the developer must also keep in active condition for two or three weeks.

In order, therefore, to enable the reader to interpret the results of his tests, it is necessary first to study the various characteristics of a developer.

The Developing Power.

When we speak of "developing power," we are using a somewhat vague term in an attempt to sum up several characteristics of the developer in one word. An accurate description of a developer cannot be given briefly, because one developer may be very powerful as regards giving extreme contrast regardless of time, while another may be very energetic and give a normal negative quickly, but is incapable of giving extreme contrast. We may consider "developing power," therefore, as being made up of the following factors:—

(a). Time of Appearance of the Image.

Every photographer has observed that after placing the negative in the developer, the time required for the first signs of the image to appear varies with different developers. The time of appearance is not an exact measure of the speed of development, because this depends also on the rate of diffusion of the developer and reaction products in and out of the gelatine film, though as a rule with a rapid working developer the time of appearance is short.

With a developer of the Elon type, the time of appearance is very short, but the image subsequently builds up slowly. With hydroquinone the time of appearance is much longer, but the image then builds up rapidly. The difference in behaviour of these two developers is illustrated in fig. 3.

Graded strips which had received the same exposure were developed in an all Elon developer (MQ-100) and in an all hydroquinone (MQ-0) developer side by side and a strip removed from each developer at regular time intervals. After one minute all the steps were visible on the Elon strip, but only the heavier exposures or high-lights were visible on the hydroquinone strip. At the end of two minutes the lower tones corresponding to the shadows in a photograph were just visible on the hydroquinone strip, but at the end of four minutes both strips looked almost alike.

When using developers of the Elon type, if the image is examined by inspection, the photographer is apt to remove the film from the developer too soon, because he is misled by the rapid appearance of the image, though from the above it is seen that to secure the same density contrast it is necessary to develop for almost the same time. We say, therefore, that Elon has a high development factor and hydroquinone a low one the development factor, or Watkins factor, being equal to the total time of development divided by the time of appearance of the image.

When comparing two developer samples, say hydroquinone, by testing developers prepared from them according to the same

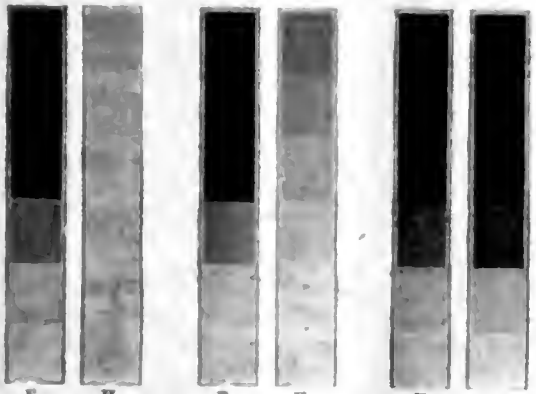


Fig 3.—Developed graded strips showing the difference in behaviour between Elon and hydroquinone.

formula, the time of appearance of the image is inversely proportional to the percentage of pure developing agent in the samples. With other developers it is a rough measure of the detail-rendering power; that is, if the image flashes up quickly and the negative is not over-exposed, then we are reasonably sure that all the shadow tones will be developed out.

(b). The Rate of Development after the Image Appears

Development consists in reducing the exposed grains of silver bromide contained in the emulsion to metallic silver. All the grains do not commence to develop at the same time, because they are distributed throughout a more or less thick layer of gelatine, but the rate at which the grains develop as a whole depends on the number of unexposed grains remaining to be developed. Therefore, as development proceeds and the number of undeveloped grains remaining becomes smaller, a fewer number of grains

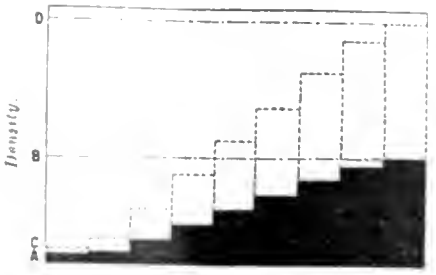


Fig. 4.—Showing the growth of density of the image during development

develops in each minute until finally it is not worth while to prolong development, because the unexposed grains then commence to be reduced to silver at a greater rate than the remaining exposed grains.

The growth of the image as a result of the development of the silver bromide grains is referred to as the growth of density, and in the case of a graded strip negative the density of the middle steps increases in the same proportion, but the lower and higher steps do not grow quite so fast. Fig. 4 represents a cross section of a strip negative developed for, say, one minute. The difference between the lowest and highest steps (*ab*) or density contrast is very small. On prolonged development each step has increased in density, and the density contrast (*cd*) is much greater than (*ab*).

The density contrast of a negative is governed both by the difference in brightness between the high-lights and shadows of the subject and by the degree of development of the negative. In order therefore to maintain the density contrast of a batch of negatives as constant as possible, films exposed on a flatly lighted subject should be fully developed, but those exposed on a contrasty subject should be developed to a less extent.

Density contrast should be carefully differentiated from *general density*. An over-exposed and under-developed negative will have good density in the shadows, but the high-lights will not be much more dense; that is, the negative as a whole will look dense but the density contrast will be small. The *maximum density contrast* is the greatest density contrast obtainable by prolonged development until fog begins to form at a greater rate than the image.

As regards maximum density contrast and speed of development, developers fall into four classes as follows:—

(a) High maximum contrast and high speed of development; that is, the negative rapidly obtains great general density and contrast. In terms of the step negative (fig. 2), the density of *b* is fairly high and the density difference *g b* is great also. Developers of this type are Elon-hydroquinone or pyro developers in combination with a caustic alkali.

(b) Low maximum contrast and high speed of development. Elon developers are of this type; that is, the image flashes up but fails to build up great density. In terms of the step negative, the density of *b* is fairly high, but the difference *g b* is comparatively small.

(c) High maximum contrast and low speed of development. Hydroquinone is a typical developer in this class; that is, the image appears slowly, but good density and contrast are finally obtained.

(d) Low maximum contrast and low speed of development; that is, the image appears slowly and development proceeds slowly, so that good contrast is not obtained.

(c) The Power of a Developer to Render Visible a Minimum Exposure.

For most photographic work this property of the developer is perhaps the most important. Contrast in a negative is not so important owing to the use of the large variety of printing media of varying contrast which take care of negatives of varying contrast. Referring to the step negative (Fig. 2), the detail giving power of the developer is measured by the difference between the density

steps *a* and *b*. This is obviously the greater the less the fogging power of the developer. The detail-giving power is usually lowered by the addition of potassium bromide, which addition is analogous to cutting off the same amount of density from each step.

The relative effect of bromide on density is greater on the first step than on the last, and this is why when testing a developer it is advisable to omit the bromide from the test formula. With some very energetic developers, however, it is advantageous to add a certain amount of bromide, because in some cases bromide restrains fog more than the image. In other words, suppose that in five minutes without bromide step *b* had a density of 0.4 and then fog commenced to form. In the next five minutes, suppose a fog density of 0.2 was formed and the total density of *b* only grew to 0.5. The effective density contrast is, therefore, 0.3. Now suppose the addition of potassium bromide cut down the density of step *b* to 0.45 and cut the fog down to 0.05. Then the density contrast or effective density of *b* is 0.4, showing the advantage of adding bromide.

J. I. CRABTREE.

(To be continued.)

THE CONTRAST RATING OF GASLIGHT AND BROMIDE PAPERS.

(A paper read at a recent meeting under the control of the Scientific and Technical Group of the Royal Photographic Society.)

THERE is a legitimate desire on the part of photographers to be provided by the manufacturers of photographic materials with as much reliable information concerning them as possible. A demand has arisen of late for the publication of some measure of the contrast-giving quality of various printing papers in place of the vague descriptions, such as "hard" and "soft," etc., which prevail at present.

The subject can be profitably discussed under the following headings, namely:—

(*a*) Whether the contrast quality of a paper can be described by one or more numerical constants of the emulsion, and if so,

(*b*) Whether there are difficulties which prevent the publication of these constants being of real value in practical photography, and

(*c*) Whether there is any alternative scheme.

In considering this matter, we are dealing with the objective phase of tone reproduction alone, and we are not concerned with the conditions which must be fulfilled to ensure exact tone reproduction involving the subjective phase as well. A complete picture of the capacity of any one printing paper to render tones is given by the characteristic curve. If two printing papers yield identical characteristic curves, they will produce similar prints from the same negative, and their respective contrast qualities will be identical. It is equally true that any lack of coincidence of the course of the characteristic curves of two papers will indicate that prints from the same negative on these papers will differ to some degree. The first part of the problem resolves itself, therefore, into a description of the paper curve if possible in a simple manner, so that the description shall be useful in practical photography. A typical paper characteristic curve (ABCD) is depicted in Fig. 1.

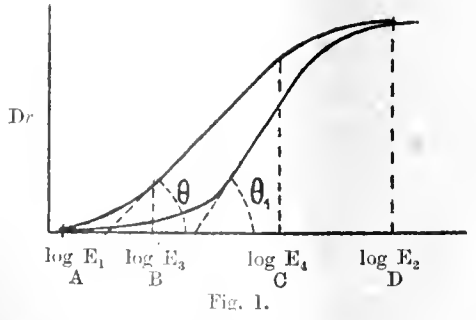


Fig. 1.

This curve is obtained by plotting the reflexion densities of the paper obtained by full development against the logarithm of the exposures that give rise to them. The reflexion densities of a paper are measurements fulfilling the equation

$Dr = \log \frac{1}{R}$, where R is the reflecting power measured decimally when the silver deposit on the paper is illuminated by a narrow pencil of light at an angle of 45° and viewed at an angle of 90°. The measurement is analogous to the H. and D. density measurement in the case of plates where $D = \log \frac{1}{T}$, T being the transparency of the silver deposit under measurement. A paper density reflecting 5 per cent. of the light reflected by the white paper base is a density of 1.3, since

$$Dr = \log \frac{1}{R} = \frac{1}{.05} = \log 20 = 1.3.$$

The characteristic curve of the paper derived in this manner exhibits the following features:—

Total Scale (Exposure Range or Exposure Scale).—In Fig. 1 an exposure E_1 gives rise to the faintest discernible tone upon the paper and E_2 gives rise to the deepest black. The ratio $\frac{E_1}{E_2}$ gives the total scale of the paper. It is that range of exposure which enables the paper to record all possible tones from the faintest grey to the deepest black

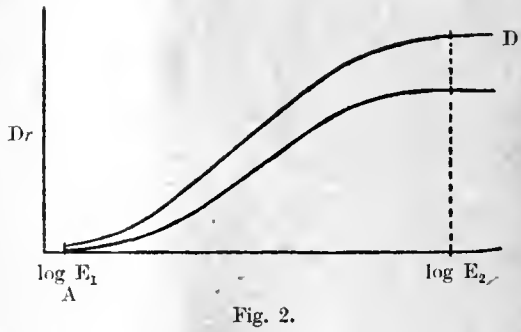


Fig. 2.

upon full development. *In practical printing this measurement is subject to a modification mentioned later.* Roughly speaking the total scale of vigorous gaslight paper is 1 to 10 and that of a soft bromide paper 1 to 50. Soft gaslight papers and hard bromide papers occupy intermediate positions. The usual condition of successful printing is that the total scale of the paper in logarithmic units should be equal to or slightly greater than the density scale of the negative. Whereas two papers with the same total scale may yield similar prints from the same negative, two papers with different total scales can never yield prints of the same appearance from the same negative. The total scale is, therefore, an important measurement descriptive of one feature of the characteristic curve of the paper. Recently this measurement alone has been suggested as a measure of the contrast quality of a paper. Alone it would be inadequate.

Gamma.—As in the case of plates, so in the case of papers, the straight line portion of the characteristic curve (BC in Fig. 1) when produced downwards will intersect the exposure axis at an angle (θ in Fig. 1). The tangent of this angle is the gamma of the paper. It is the recognised practice of skilled photographers to develop gaslight and bromide papers fully. It is known that whereas the gamma of a paper increases as development progresses in just the same manner as it does in the case of plates, yet after a comparatively short time of development, considerably short in fact of the development time used by good workers, the gamma obtained is the maximum gamma of the

paper and further development occasions no further increase. The gamma of a paper is therefore the gamma infinity (γ_∞) of that paper. A vigorous gaslight paper yields a gamma infinity of 2.0 or somewhat over, and a soft bromide paper may yield a gamma of about 1.3 approximately.

In Fig. 1 are depicted the characteristic curves of two papers with the same total scale but different values for gamma (θ and θ_1). They would yield different prints from the same negative. The characteristic curves of two papers cannot coincide unless both the exposure scale and gamma measurements are equal respectively. It is therefore necessary to know both these measurements if the contrast quality of the paper is to be defined.

Maximum Density.—The maximum density of the paper (D in Fig. 2) is a measurement of great practical importance. Other things being equal, the deeper the black that a paper will yield, the more it is esteemed for practical print production. The surface of the paper has a marked influence upon this measurement. With similar emulsions the depth of black is determined by the "glossiness" of the paper surface: the more glossy it is the deeper the black recorded. With similar paper surfaces the depth of the black is determined by the nature of the emulsion: the deeper the black the better the emulsion. In Fig. 2 are depicted two paper curves with similar total scale measurements, but different measurements for the maximum density (D and D_1). These papers would yield prints of a different character from the same negative. It is necessary, therefore, to add the measure of the maximum density (black) to the constants total scale and gamma already described.

Rendering Power.—By this term is meant the capacity of a paper to reproduce the negative gradations with relative fidelity. Relatively true reproduction is confined to the tones which lie upon the straight line portion of the paper curve. Other things being equal, the paper with the longer straight line portion of the characteristic curve in comparison with the total length of the curve is the better paper. In Fig. 1 the whole curve *AD* subtends an exposure scale from E_1 to E_2. Of this whole curve the portion *BC* is straight, and subtends an exposure scale from E_3 to E_4. The rendering power is $\frac{\log E_4 - \log E_3}{\log E_2 - \log E_1}$ and, being a fraction, it is usual to multiply it by 10 for convenience. Very few papers have more than half their total curve straight equivalent to a rendering power of 5. A poor paper may have a rendering power of less than 2, indicating that it is capable

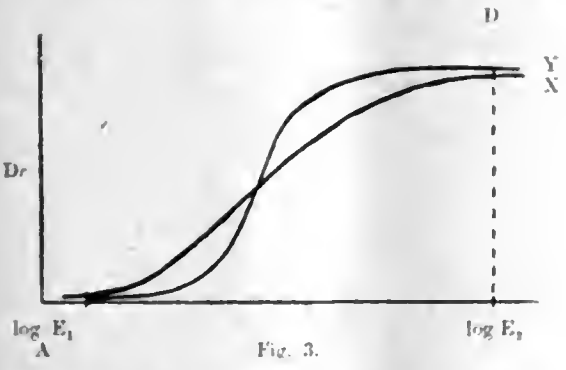


Fig. 3.

of rendering but few tones with truth at one and the same time. Papers of good and bad rendering powers (X and Y) are depicted in Fig. 3.

They possess the same total scale and the same maximum density, but the lack of coincidence of the curves indicates to what extent prints upon them from the same negative would differ.

The four constants described would by their equality indicate with a fair degree of precision that the paper curves were identical and that similar prints could be expected from the same negative.

Summarised, they are measurements of—(1) Gamma infinity. (2) Total scale. (3) Maximum density. (4) Rendering power.

No one of these constants is sufficiently descriptive of the contrast quality of the paper to be a reliable indication of the character of the print that it would yield, but it would be as well to consider whether their number can be reduced without making the information conveyed by the reduced number practically useless

In the first place, however, I will consider some of the difficulties, if any, which may prevent all or any of these measurements being of real practical value in photography.

Age of the Printing Paper.—It is an unfortunate fact that with age and the influence of storage conditions the emulsion constants change. Granting their truth when computed by the paper manufacturer, the paper when it reaches the user may have changed sufficiently to negative the value of the measurements. When perfectly fresh paper can be obtained this objection vanishes.

The Measurement of the Total Scale and of the Maximum Black.—It might at first sight be considered that the total scale should be the range of exposures embraced by the whole characteristic curve from the foot to the summit (PM in Fig. 4.) In ordinary printing this is not practicable, and the total scale which can be utilised at any one time

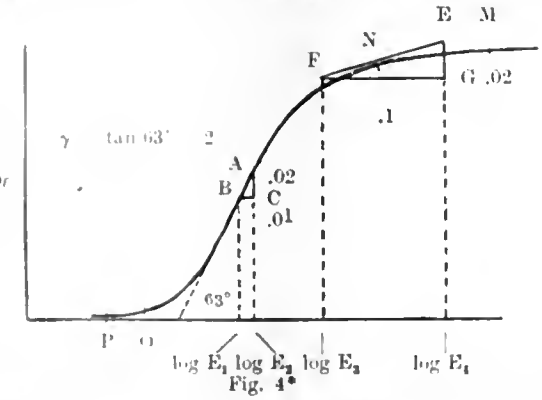


Fig. 4*

is considerably short of this. The extent to which modification of the total scale and maximum black is needed in practice is illustrated in Fig. 4.

Let the gamma of this paper be 2, so that the angle made by the straight line portion with the log exposure axis is 63°. Choose two points A and B on the straight line portion of the paper curves so that density A is just perceptibly darker than density B. The difference between A and B will be about 0.02. Construct the right-angled triangle ABC so that AC = 0.02. Then from tangent ABC = $\frac{AC}{BC}$ we have 2 = $\frac{.02}{BC}$ ∴ BC = .01. But BC = $\log E_2 - \log E_1$, therefore the exposure increase required to give the least perceptible difference in paper densities lying upon the straight line portion of the curve is 0.01 in log units, or an increase in exposure of 2½ per cent. in ordinary units.

Now consider the "shoulder" of the paper curve. Choose a point N and draw FE as a tangent. Complete the right-angled triangle FEG so that EG = 0.02 and represents the smallest perceptible paper density difference. Just as BC represented an exposure required to register a paper density difference lower down in the curve, so does FG represent another exposure difference necessary to record the least perceptible paper density difference at N. Obviously FG is greater than BC, and the higher the point N is placed the greater FG becomes. If the angle EFG be 11° then as tangent 11° is $\frac{1}{5}$, FG must equal 0.1. An exposure difference ($\log E_4 - \log E_3$) of 0.1 is equivalent to a 25 per cent. increase in exposure in order to record a least perceptible paper tone difference. A fundamental difference between the paper densities lying on the straight line portion and those on the curved portions of the paper characteristic curve is that the latter require very much greater exposure differences, and hence greater negative density differences, to bring out the paper tones, and the matter becomes worse the higher the point N be taken or the lower the point O. No negatives made will comply with these paper requirements driven to extremes. It has been considered by Mees, Nutting and Jones that when it takes more than 25 per cent. increase in exposure to register a separate paper tone, the useful limit of the paper in practical printing has been reached. Practically speaking, then, the total scale is represented by the exposure range required to give O N and not P M and the maximum black in practice is N and not M. The points N and O are such that the gradient of the curve at those points $\left(\frac{d D}{d \log E}\right) = 0.2$. It remains for this

* This figure is purely diagrammatic, and is exaggerated for the sake of clearness.

meeting to decide whether manufacturers can agree to such a standard for total scale and maximum black. It is to be feared that both these measurements may become the butt of competitive advertising, and that the larger they are the better they will be considered by the public. It is almost certain that the scale PM will be chosen by some manufacturers, and also M as a measure of black. If that be so, the utility of the measurements in practical work will be largely nullified.

The Measurement of Gamma.—This should present little difficulty. The gamma required is that attained on full development (γ_∞). The prevalence of under-development on the part of paper-users will tend to prevent them from deriving the full benefit from the information that a γ_∞ measurement gives. However, that will be the fault of the users.

The Measurement of Rendering Power.—The need for a conventional measurement of total scale has been mentioned. As the rendering power is a relationship between that portion of the characteristic curve which is straight and the total scale, and as the length of the straight line portion is occasionally a matter of opinion, I can see but little hope that manufacturers' figures will be comparable. It is also extremely unlikely that papermakers are going to advertise a low rendering power when they happen to be so unfortunate as to make a batch of paper less good than usual. I am convinced that this difficulty will exist and that it is a very real one. It is equally applicable to all sensitometric measurements indicative of quality.

It would appear, therefore, that there are a considerable number of difficulties to overcome in order that the four constants described can be published and serve as a measure of the contrast-giving qualities of a printing paper. These difficulties diminish if we can decide to discard some of the constants and regard one, or possibly two, of them as sufficiently descriptive to serve our present purpose. I regard the measurement of the gamma infinity as absolutely essential. I would like to retain the measurement of the total scale if possible, and thus make the gamma and total scale the minimum requirement of a statement as to contrast quality. I think that the maximum density and the rendering power could be discarded, although to those who appreciate their significance these constants convey eloquent information as to the quality of the paper. It seems to me that this meeting might consider to what extent the gamma infinity alone would constitute a satisfactory measure of the paper contrast. In my experience it is seldom that a developing out paper when fully developed yields a characteristic curve with an angle of less than 50° to the exposure axis, nor is it usual for the slope of a vigorous paper to be more than 70°. The tangent of the former (gamma) is 1.2 and that of the latter about 2.6. I can see no objection to the use of the actual gamma figures on the paper package, though some manufacturers may prefer to use letters or marks synonymous therewith.

So far as we have gone, therefore, I am of the opinion that—(1) The contrast quality of a paper can be fully described by the measurement of:—(*a*) Gamma infinity. (*b*) Total scale. (*c*) Maximum density. (*d*) Rendering power.

(2) Of these four constants the gamma infinity measurement is essential, the total scale very desirable, and the remaining two are probably optional so far as an approximate contrast description is concerned.

(3) A stale or semi-stale paper cannot be relied upon to behave in accordance with its description when freshly made.

(4) The measurement of these constants presents difficulties, particularly in regard to total scale and rendering power. It is unlikely that various manufacturers' figures will be comparable.

(5) There is danger that competitive advertising will impair the accuracy of any measurements.

An Alternative Scheme.

Let us consider whether there is any alternative scheme which will do away with the necessity of publishing the emulsion constants. A finished print owes its appearance to the collective action of the emulsion properties, of which the more important have been described in this paper. Prints upon different papers from the same test negative would indicate by their similarity in general appearance that for practical print production the papers had similar properties. On the other hand, marked dissimilarity between the prints would indicate that one or more of the emulsion constants of one paper differed from those of another. It might be possible for manufacturers to adopt about six standards of contrast, ranging from the present-day vigorous gaslight paper standard to that of a soft bromide paper. Using a test negative kept for the purpose, a set of prints illustrating each of these broad contrast classifications would enable further batches of paper to be classified by visual comparison. The eye is able to judge print differences and print similarities tolerably well when the prints compared are of the same size and the same depth and are made from the same negative. The six degrees of contrast could be labelled by the manufacturer in an appropriate manner (A to F or 1 to 6), so that the user could order a similar stock of paper by quoting the maker's classification. Such a scheme is, of course, merely an advance in point of fine classification over the present system of descriptive words, viz., hard and soft, etc.

I am not in the position to venture an opinion as to the feasibility of this alternative scheme or otherwise. If it be a fact that the present-day manufacture of developing out papers is so advanced in control that manufacturers can turn out papers of different degrees of contrast at will, then there should be no difficulty in adopting a scheme of classification similar to the one described, to the material advantage of photographers. The effect of age upon the classification would remain a disability and various makers would probably have different standards and classification marks. In the course of time, however, the big user might learn that Messrs. X's paper classified as 3 was equivalent to Messrs. Y's paper classified as B, and so on. If, on the other hand, the degree of contrast exhibited by an emulsion be not completely under the manufacturer's control, then difficulties are apparent at once. If, for example, a manufacturer supplies a paper, and subsequently fails to repeat the manufacturing conditions with sufficient exactitude to renew that emulsion, there will be immediate dissatisfaction with the scheme. An admission of inability to repeat a paper whenever required would be exceedingly damaging to any firm that adopted a policy so honest. It must be confessed that the ignorance displayed by the average photographer concerning the fundamental properties of the materials at his disposal practically compels manufacturers to describe their products in the way that photographers find most pleasing, whether that description be strictly truthful or not. It would be futile to consider any scheme of contrast rating without bearing in mind the possibility of false description. The well-known mis-statements of H. and D. speed numbers in the case of plates are an eloquent object-lesson in this respect.

There is a remaining point of considerable importance. As the development of a paper proceeds there is an increase in gamma, an increase in the black attained, and a decrease in the total scale. When gamma infinity is reached by a sufficiently full development, these measurements reach their final values and remain constant during further development. Whatever the manufacturer publishes, whether emulsion constants or a classification mark, the information should be that obtained by development to the gamma infinity of the paper. It is an unfortunate fact that few workers develop bromide paper to gamma infinity, and few who attempt to do so are frequently deceived when unexpectedly they obtain a batch of paper particularly slow in development. In order that the makers' classification should bear fruit in practice, it is essential for photographers to develop their prints fully. I have indicated elsewhere that factorial development enables this to be done with certainty, but this method appears to remain neglected, particularly by professional photographers. It appears to me, therefore, that it will be necessary for paper manufacturers to give some indication as to whether the user is dealing with a paper of quick or slow developing properties, in order that the under-development of the latter type may be avoided, and so that the paper may yield a finished print in accordance with its specification.

B. T. J. Glover.

Change of Business Name.—Mrs. Beatrice Cundy, of 12 (late 6), Baker Street, Portman Square, London, W.1, writes:—"Owing to family reasons, as from March 7, 1922, I am closing down the business which has been run in my maiden name of Lena Connell. After that date I intend professionally specialising in at-home portraiture in my married name, Beatrice Cundy. Sittings can still be arranged for, and particulars given at the above address."

DEATH OF MR. ALEXANDER COWAN.

We greatly regret to record the death on March 3, in his eighty-sixth year, of Mr. Alexander Cowan, one of the veterans of photography, and for many years head of Messrs. Marion's dry-plate factory at New Southgate. Mr. Cowan, who had been living in retirement for some years past, first at Wembley and latterly at Letchworth, preserved remarkable mental and physical vitality. He had exceeded the age of seventy by some years when he retired from the active supervision of the manufacture of plates and papers for Messrs. Marion, with which he had been associated from almost the outset of the dry-plate process. Yet at that time he had the appearance and activity of a man in the mid-fifties. Throughout his career, Mr. Cowan made and published many contributions to the technical processes of photography. In the early days of the dry-plate process, when methods and formulæ were the subject of

Alexander Cowan

free discussion, he was among the leading experimenters by whom the common stock of knowledge was enriched. And his mechanical aptitude was evidenced in the design of many appliances for adapting the practice of photography to the different conditions imposed by the change from wet collodion to dry plates. We believe that he was among the first in this country to see the possibilities in a self-toning paper, and that he made emulsion paper answering to this description. His death removes one of those who have witnessed the development of photography to its present industrial importance, and have taken an important share in that development. Before joining Marions Mr. Cowan was for many years manager of Hills & Saunders' studio at Porchester Terrace; he was a first class portraitist. In his early youth he was engaged at Paul Pretsch's photo-galvanographic works at Holloway.

Photographs in Guide-Books.—Last Monday's "Times" contained a pithy leaderette on the truthfulness of pictures in guide-books, publications in which "ever truthful" photographs are not employed to the extent they deserve to be. "A truthful guide-book, if it could circumvent the vigilance of the local mayor and corporation and the hotel-keepers, would be an invaluable compilation. Too often (said the writer) it is, at its truthfullest, only a compromise, as when a place is said to 'cater for all tastes.' Illustrators, again, whose skilful brushes adorn the pages of many a guide-book, are apt, through a fault presumably of the artistic temperament, to mislead as much as the writers. Only once do we remember having seen in a guide-book the picture of a town on a wet day. The artist could depict rain very well, and that was, perhaps, why he did it; but he did not do it so beguilingly as to create an illusion in favour of a wet day at that particular town; yet the idea is suggestive, and if it were consistently carried out, as the obverse of the fine weather picture, it would help us materially to make up our minds before setting out."

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

Report of the Council.

Your Council are gratified to record that during the year 1921 the influx of new subscribers has been fully maintained—126 being an advance upon the past average. Resignations have been few, and in most cases were attributed to unavoidable causes.

The year has been productive of pronounced advancement in up-to-date methods and policy, culminating :—

(1) In a change of date and headquarters of the 1922 Congress.

(2) In the important steps taken by your Council in regard to the incorporation of the Association, and it is satisfactory to note the unanimity that prevailed when the whole scheme was laid before the members at the Special General Meeting held December 1, when it was moved and carried unanimously "that the Council of the Association do continue and act upon the resolution passed at the Annual General Meeting held April 22 (Congress week)" etc., etc.

Incorporation has proved a tiresome and tedious procedure, but owing to the patience and skill of the honorary solicitor (Mr. Reginald Vaughan of the firm of Stone's Morris and Stone), the registration of the Association is now an accomplished fact.

The 7th Congress was held April 18-22, and though the whole of the arrangements were made during the time of strikes and the uncomfortable threat of a general railway stoppage, everything fixed was successfully carried out.

The programme of lectures and demonstrations, covering a wide range of subjects, was a full one. The contributors included : Mr. H. W. Bennett, F.R.P.S., Madame Yevonde, Mr. N. E. Luboshey, Mr. C. P. Crowther, F.R.P.S., Mr. A. C. Braham (Autotype Co.), and Mr. S. H. Greenway.

The visit to the Guildhall, the Courts and Museum, and the kindly welcome extended by Sir Louis Alfred Newton on behalf of the Rt. Hon. the Lord Mayor, was characteristic of the world-famed hospitality of the City of London Corporation, and was greatly appreciated by the visitors.

The invitation extended by Sir William Jury to witness at his private theatre a demonstration of Prizma motion colour photography was largely attended.

A special feature of the week's entertainments was the invitation visit to the works of Kodak, Limited, at Harrow. The plans made were at the last moment upset (owing to Government restrictions) and the railway company telegraphed their inability to fulfil the contract with Messrs. Kodak to supply a special train, but with commendable promptitude a fleet of motor char-a-bancs was obtained and the large party of guests (conveyed to their destination by that means) spent a most interesting and enjoyable afternoon and evening.

The picture exhibition at the Royal Horticultural Hall—designed to illustrate and advertise the present position of professional photography, was another step in advance of former efforts, but owing to the lack of wall space it was only possible to accommodate a limited number of the pictures sent in. There was a notable increase of technical and commercial exhibits.

A happy termination of the Congress proceedings was the annual dinner, held at Gatti's Restaurant, Strand, on the evening of Friday, 22nd, when a large company assembled to do honour to the outgoing and incoming presidents—Messrs. Frank Brown, Leicester, and A. Swan Watson, Edinburgh.

The 1922 Congress is arranged to take place at Princes Galleries, Piccadilly, W., September 11-15 inclusive.

Your Council have pleasure in referring to the visit paid in July to America by Mr. Reginald Haines, who, at his own expense, represented this Association at the Buffalo Photographic Convention, where he was most kindly received and officially welcomed. At the October meeting of the Council Mr. Haines described his experiences, and announced that the happy thought of presenting in the name of the P.P.A. a miniature replica of the British national flag was received with great enthusiasm, and added that it was immediately decided to return the compliment.

On the evening of September 14 the Council entertained to dinner the world-renowned men's photographer, Mr. Pirie MacDonald, of New York. The opportunity was taken by the guest to convey in glowing terms the appreciation felt by the American photographers of the brotherly message of goodwill brought to them from England by Mr. Haines. Mr. Macdonald expressed the opinion that a bond of fellowship was now established that would be good and useful to both countries.

It is in sad remembrance that the death of Mr. S. H. Fry has to be recorded. He passed away on July 8. One of the first subscribing

members, he lived to do good work for the P.P.A.; was many years a member of the Council, and filled the posts of honorary treasurer, secretary and trustee. At the invitation of the Council Mr. George Hana accepted the vacant trusteeship.

The advantages in the reduction of premiums offered by the British Dominions Fire Co. have been largely accepted—the sum represented being £41,844. The probable stocking of celluloid flat films and the attitude to be adopted towards members by this Company, have been fully discussed in conference, and a satisfactory understanding come to, whereby no extra premium will be charged.

After a series of deputations and discussions with the Westminster Electric Light Co your Council have been successful in obtaining a reduced rate of 4d. per unit for studio arc lamps and special lighting equipment.

At the request for professional portrait exhibits by the Canadian Government, your Council authorised the Sub-Committee to collect and send some pictures to the Vancouver Exhibition. A collection was forwarded and much appreciated, and it is pleasing to note that two of our members, viz., Messrs. Herbert Lambert and William Crooke, were each awarded a silver cup. Exhibits were also forwarded to the South African and Copenhagen Exhibitions.

It is gratifying to record that cordial relations are still maintained between ourselves and kindred societies in other lands.

In the course of the year your Council has dealt with requests for guidance and advice upon a wide range of professional subjects, including:—Damage of goods by rail and post; Rent Restrictions Act; assistants' wages; early closing; ancient lights; visits of travelling photographers to a town, and how to frustrate their methods; income tax; exchange and sale; apprenticeship; difficulties with the Press; infringement of copyright; employers' liability; ownership of negatives; general insurance, etc.

Many letters of thanks, and in some cases thank-offerings, have been received.

Two cases were of outstanding interest, clearly illustrating the influence of the Association when used in support of a member:—

(1) The premises of a country member were burnt out, but the settlement of the claim was held up owing to a disagreement between the opposing fire assessors over the amount to be allowed for salvage. The aid of the Association was sought, and a meeting of the parties was arranged in London, resulting in a satisfactory settlement of the dispute.

(2) Early in September a member complained that after his camera had been placed in the luggage van of a Great Western train, he was charged for its transit, and was unsuccessful in getting the money refunded. The matter was laid before the Council, and the General Manager written to, and on September 28 a deputation waited upon him at Paddington Station. After some discussion a promise was given that the matter should have consideration. It has since transpired that cameras carried as personal luggage will not be charged for.

The scale of Press minimum reproduction fees arranged and fixed by your Association is working satisfactorily. A copy of the agreed scale may be obtained by application to the secretary.

The attendance record is as follows—the number of Council meetings held being 11, and Finance meetings 11.

COUNCIL.

London.		Country	
Angus Basil	11	Marcus Adams	11
Arthur Bennett	5	Frank Brown	9
Gordon Chase	10	W. B. Chaplin	7
Alexander Corbett	10	H. A. L. Chapman	4
C. F. Dickinson	7	Tom Chidley	5
Alfred Ellis	11	William Illingworth	10
W. E. Gray	7	Herbert Lambert	6
Reginald Haines	10	Fred. Read	1
George Hana	11	H. C. Spink	4
Richard N. Speaight	9	T. C. Turner	2
H. A. St. George	9	A. Swan Watson	5
F. G. Wakefield	10	W. H. Wedlake	7
		Halksworth Wheeler	5

FINANCE COMMITTEE.

Mr. Chase	9
,, Corbett	11
,, Ellis	10
,, Haines	9
,, Speaight	8
,, Wakefield	4

The thanks of the Association are hereby tendered to the editors of the "British Journal of Photography," "Amateur Photographer," Houghton's "Bulletin," the "Photographic Dealer," and the Kodak "Professional Photographer," for publishing reports and helpful reference to the Association's work. The Council also desires to place on record its thanks to Mr. Reginald Vaughan, the honorary solicitor, for his continued assistance and guidance

On behalf of the Council,

LANG SIMS,
Secretary.

ROYAL PHOTOGRAPHIC SOCIETY.

THE NEW PRESIDENT.

IN electing to the Presidency of the Society Mr. W. L. F. Wastell, the members have paid a deserved tribute to one who has identified himself with the practice of photography for many years, and by contributions, which for the most part have been anonymous, has done a very great deal to promote a sound knowledge of photographic technique. These writings of Mr. Wastell's are thus much

Portrait by] [*George Hawkings.*

MR. W. L. F. WASTELL,
Elected President of the Royal Photographic Society, March 14, 1922.

less widely known than the weekly page of humour, often embodying much sound sense, which for nineteen years past he has written in "Photography," now the "Amateur Photographer." As the author of "Piffle" "The Walrus" has become a celebrity, enjoying the affections of photographers to a degree which is certainly not equalled by any of those whose work for the photographic press has dealt with the severe technics of the subject, or even in the endless discussions of pictorial questions. These chapters of wit and nonsense now number nearly 1,000. Some day, perhaps, Mr. Wastell may collect them in book form, endowing the craft, so to speak, with a comic history of photography in the style of Gilbert à Beckett. To what extent he will be able to import a humorous flavour at Russell Square into discussions of halide grains or gamma infinity remains to be seen, but we have our hopes for the best. By profession a school-master, whose scholastic work has been chiefly in mathematics and English, Mr. Wastell brings to the affairs of the Royal a trained and logical mind, and we have confidence that under his guidance the Society will progress on sound lines. His photographic interests are broad, and, outside photography, his amateur pursuits include water-colour painting, the violin, wood-working, books, and, as we have heard him remark, influenza in all its varieties.

MESSRS. J. H. DALLMEYER, LTD., are issuing an attractive shelf slip to dealers. The words "Insist on a Dallmeyer Lens" appear in white ivory-like letters on an imitation red plush ground.

Exhibitions.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The twenty-seventh annual exhibition of the society was opened last week at the South London Art Gallery, Peckham, and will remain open until the 25th inst. Although called the twenty-seventh annual exhibition it is eight years since the last one was held. The society, which is now one of the foremost in London, has been famous for its exhibitions for many years, and their revival is an event of some considerable importance.

Mr. C. Pollard Crowther gave on the opening evening an entertaining lecture on "Portraiture and Colour," the exhibition being officially opened by Dr. G. H. Rodman, President of the Royal Photographic Society. Dr. Rodman, in declaring the exhibition open, said he was very pleased with the high standard of work. He was also pleased to see the South London Society resuscitated after a lapse of some years, and it was more pleasing to know that it was affiliated with the Royal Photographic Society since 1889—which meant that it was about the oldest society affiliated with the parent body. South London always had a reputation for good exhibitions—exhibitions that commanded a deal of attention generally, and he congratulated the members on their progress.

Mr. Bertram Cox acted as judge, and made the following awards:—Class A.: Bronze Plaque, Herbert Lambert; Bronze Medals, Hugo van Wadenoynen and J. Arthur Lomax; Hon. Mention, H. W. Stowe, Herbert Felton, Miss Dora Head, Harry Abbott, junior, M. O. Dell and W. R. Fernley. Class B: Bronze Plaque, C. J. Unsworth; Hon. Mention, E. Tinker, W. Selfe, Louis J. Steele, H. Pickwell, Harry Abbott, junior, A. O. Forder, C. W. Colthrup and Herbert Felton. Class C: Bronze Plaque, C. W. Colthrup; Hon. Mention, Captain J. W. Bamfylde. Class D: (Members only), Bronze Plaque, W. B. Ashmole; Hon. Mention, Harry Abbott, junior, W. H. Howard, Herbert Pickwell, L. Clampch, Mrs. C. Nunn. Class E: (Members only), Bronze Plaque, Harry Abbott, junior, for the subject "The Monkey"; Bronze Medal, Captain J. H. Jennings, "Victorian Memorial"; Hon Mention, R. C. Snell and E. R. Bull.

The collection of pictures on loan, and not for competition, includes some excellent studies in child life by Mr. Marcus Adams, and a series of landscapes, of perfect pictorial and technical qualities, by Mr. Arthur C. Banfield

FORTHCOMING EXHIBITIONS

March 4 to 25.—South London Photographic Society. Particulars from the Hon. Secretary, Harry Abbott, 61, Peaoval Road, East Dulwich London, S.E.22

March 15 to 26.—Welsh Salon of Photography. Particulars from the Secretary, H. G. Daniel, 154, Penylan Road, Cardiff.

March 16 to 18.—Leytonstone and Wanstead Camera Club. Particulars from the Secretary, Charles Wormald, 1, Colworth Road, Leytonstone, London, E.11

March 27 to April 8.—Dennistoun Amateur Photographic Association. Particulars from the Exhibition Secretary, Colin Graham, 448 Duke Street, Dennistoun, Glasgow.

March 28 to April 1.—Hackney Photographic Society. Hon. Secretary, Walter Selfe, 24, Pembury Road, Clapton, London, E 5.

April 5 to 8.—Leicester and Leicestershire Photographic Society. Latest date for entries, March 22 Particulars from the Hon. Secretary, W. Bailey, Cank Street, Leicester.

April 5 to 8.—Faversham Institute Photographic Society Latest date for entries, March 31. Particulars from the Hon. Secretary, W. H. Evernden, 116, West Street, Faversham.

April 21 to May 11.—Hammersmith Hampshire House Photographic Society. Latest date for entries, March 30. Particulars from the Hon. Exhibition Secretary, J. Ainger Hall, 26, Bishop's Mansions, Bishop's Park Road, London, S.W.6.

May 1 to 6.—Photographic Fair Horticultural Hall, Westminster Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1.

September 11 to 15.—Professional Photographers' Association, Princes Galleries, Piccadilly, London, W. (Trade and Professional). Hon. Secretary, Richard N. Speaight, 157, New Bond Street, London, W.1. Also foreign invitation loan exhibition of professional portraiture. Hon. Secretary, Marcus Adams, 43, Dover Street, London, W.1.

September 18 to October 28.—Royal Photographic Society. Latest date for entries by carrier, August 25. Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

Patent News.

Process patent applications and specifications—are treated in "Photo-Mechanical Notes."

Applications February 27 to March 4:—

Developing Tank.—No. 5,971. Tank for developing and fixing photographic films. Amalgamated Photographic Manufacturers, Ltd., and M. Rycott

Colour Photography.—No. 6,099. Apparatus for reproduction on paper of Autochrome, etc., plates in colours. E. Bueno.

Colour Photography.—No. 6,253. Colour photography. Sir C. S. Forbes.

Developing Apparatus.—No. 6,292. Apparatus for developing photographic films. L. M. Ellis.

Printing Apparatus.—No. 6,115. Photographic printing apparatus.—J. Evans

Finishing Prints.—No. 5,785. Production and finishing of photographic prints. G. E. Hadley.

Colour Photography.—No. 6,291. Apparatus for multi-colour photography. J. Mroz

Reversal Processes.—No. 5,873. Photographic reversal processes. Kodak, Ltd

Photographing Sound Waves.—No. 5,960. Production of sound-wave photograms. R. Mylo.

Cinematography.—No. 6,471. Projection of moving pictures. Bardy Motion Picture Machine Co.

Cinematography.—No. 6,325. Automatic picture projection. W. C. Chamberlain.

Cinematography.—No. 6,408. Records for cinematography. W. Gowlland.

Cinematography.—No. 6,11b. Cinematographic screens. A. V. F. Marion.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention

Metallic Lantern Screens.—No. 174,957 (May 17, 1921). This invention relates to opaque screens for use in connection with cinematograph lanterns and like projection apparatus, of the kind having a metallic surface formed of powdered aluminium, silver, bronze, etc. The invention consists in an opaque screen having a metallic surface formed of powdered aluminium or the like upon a coloured background and matted by means of barium sulphate.

The object of the invention is to make such screens capable of producing a colour effect instead of the usual black and white effect produced by the present screens of this type, and to reduce as far as possible the shadow effect which is rather pronounced with metallic or metalised screens when viewed from acute angles and to obtain an even diffusion of light at all angles of observation. Whilst any colours except black and white may be used, the colours preferably used are orange, or red, as being most suitable for general use. Green and blue backgrounds may be suitable for reproduction of wooded and like scenery and of seascapes.

Whilst the metalised surface of the screen has generally the effect of reflecting the light and of producing a very clear reproduction of fine detail, the coloured background has the effect of giving a certain tone to the picture.

For reducing the shadow effect and for matting the brilliant metallic surface barium sulphate is used as a final coating, which is applied to the metallic coating. The barium sulphate may also be mixed with the metallic powder.

The coloured background for the metallic surface may be produced in any suitable manner, but it is preferred to prepare this background in such a manner as to enable the metallic surface to be formed thereon in the usual manner.

A screen embodying the features of the invention may be prepared in the following manner. A canvas or cotton fabric in one seamless sheet is prepared in the usual way for painting. One or more coats of paint containing each white lead, red lead (or orange powder or other colouring matter), genuine linseed oil and liquid dryers, are then applied either by means of a brush or of a hand-spraying machine. If hand-painting is used the surface should be carefully stippled. A final coat is then applied which contains, in addition to the above-mentioned ingredients, heavy stand oil. A metallic powder, for instance aluminium powder, is then thrown by hand upon the final coating, which should be in a suitable condition, *i.e.*, nearly dry, but should have sufficient tackiness to hold the powder. The metallic powder is gently brushed all over the surface and is finally, after a suitable interval, brushed off. The powder may, of course, be applied in any other suitable manner, for instance, it may be sprayed on. The sheet is then sprayed with a mixture of highly refined barium sulphate and glue dissolved in water. Instead of spraying the barium sulphate on to the aluminium, the barium sulphate may be mixed with the aluminium.

The combination of a coloured background with a metallic surface consisting of powdered metal and matted by means of barium sulphate is the main feature of the invention, the object of the coloured background being to soften the hard effect produced by the metallic surface and to give a definite tone to the picture. —Julian Macartney Ogilvie, 24, Nevern Square, Earls Court, London.

The following complete specifications are open to public inspection before acceptance :—

Cinematography.—No. 175,968. Motion-picture projection apparatus. Pathé Cinema Anciens Etablissements Pathé Frères.

Image Transforming Method.—No. 175,988. Method of transforming photographic silver images into tanned gelatine images. P. Schrott.

Shutters.—No. 175,991. Photographic shutters. A. Wollensak and F. A. G. Pirwitz.

Photographing Mount Everest.—Describing the preparations for this year's Mount Everest Expedition "The Times" gives the name of Capt. J. B. L. Noel, M.G.C., as the photographic officer, and says that the photographic outfit is very complete. The apparatus includes three cinematograph cameras, of which one is equipped with a battery of lenses up to 20-in. focal length; two panoramic cameras, of which one rotates through the complete circle; four cameras for glass plates, including one 7½ in. by 5 in., all fitted with telephoto lenses; one stereoscopic camera, and five Kodaks, besides a variety of private cameras belonging to different members of the party. The dark-room equipment includes all that is required for developing cinematograph films in the field.

The American Rush for Royal Wedding Pictures.—The "Star" gives further details of the extraordinary scrimmage for films and prints of the Royal wedding. It is stated that when the "Olympic" reached New York she was besieged by a horde of photographers' assistants trying to secure the photographs which were in charge of the purser. Eight tugs lined up alongside the ship the moment she dropped anchor, and as soon as the liner was cleared by the doctors the photographers scrambled aboard and charged for the purser's room. There was a howl of dismay when the purser announced that he could not deliver the films until the ship had docked. Pleas and protests were unavailing until a committee of the photographers sought out Captain Hambleton, who gave instructions to the purser to hand over the pictures to those having orders to receive them. Then another merry battle ensued, the photographers' assistants rushing back to the dock, knocking passengers right and left in their frantic efforts to save precious minutes. One man had his films in a waterproof cylinder, to which several toy balloons were attached, in order to give the cylinder buoyancy.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Monday, March 20.

Birmingham Photographic Art Club. Slide Night.
Bradford P.S. "Gum Bichromate." J. Harold Leighton
Dewsbury P.S. "Holiday Rambles." Alf. Darley.
Forest Hill and Sydenham P.S. "Bromoil." A. H. Johnston.
Glasgow and W. of Scot. Amat. P.A. Affiliation Competition Prints and "Amateur Photographer" Prize Slides, 1921.
Kidderminster P.S. Annual Competition.
Leeds Camera Club. Exhibition of Members' Work.
Rotherham P.S. "Intensification and Reduction." A. Dordan Pyke.
Southampton Camera Club. Lantern Slide Competition.
South London P.S. "Wonderlands of the Western World." J. Dudley Johnson.
Wallasey Amateur P.S. "Rambles in Somerset and Wiltshire." W. A. Mackie.
Walthamstow P.S. "Improving the Print." W. Bullock.

Tuesday, March 21.

R.P.S. "Landscape from the Practical Side." S. Bridgen, F.R.P.S.
Bournemouth Camera Club. "A Talk on Lantern Slides." R. Y. Banks.
Cambridge Phot. Club. "Greenland." Prof. A. C. Seward.
Exeter Camera Club. "Through the Grecian Archipelago." Messrs. Butcher and Sons.
Hackney P.S. "After-Treatment of the Negative." E. W. Taylor.
Leeds Phot. Soc. Annual Meeting.
Nelson P.S. "Spark Photography." W. D. Chalmers.
South Glasgow C.C. Lantern Slide Monthly Competition.
South Shields P.S. "Enlarging." Fred Buffham.
Stalybridge P.S. "Bits of Wales." J. W. Pickering.
Tyneside P.S. "Pictorial Photography." H. S. Becke.

Wednesday, March 22.

Belfast C.P.A. Camera Club. "The Wave Theory of Light." R. Stanley, B.A.
Borough Poly. P.S. Second Lecturette Competition.
Catford C.C. "Simple Picture Making." R. H. Lawton
Croydon C.C. Novelties and Home-Made Apparatus.
Dennistoun Amat. P.A. Portfolio and Lantern Slides.
Ilford P.S. "A Holiday in Kent and Surrey." W. E. Lambert.
Partick Camera Club. Whist Drive.
Photo-micrographic Soc. Members' Evening.
Rochdale Amat. Phot. Soc. "Development of the Plate." A. F. Barnes.
Rotherham P.S. "The Making of Portraits." C. Pollard Crowther.
South Suburban P.S. "Through the Grecian Archipelago." W. Butchers and Sons.
Wombwell P.S. "Home Photography." A. Dordan Pyke.

Thursday, March 23.

Camera Club. "Composition as Taught by the Works of the Old Masters." Mr. Spurrier, R.O.I.
Gateshead Camera Club. "The Effect of Light in Photography." Douglas Weddell.
Hammersmith Hampshire House P.S. "Some Pitfalls of Portraiture and How to Avoid Them." A. J. Lyddon.
Letchworth Camera Club. "Amateur Work with the Camera." S. F. Clarke.
Liverpool Amat. P.A. "Old Shrewsbury." F. C. Larkin.
North Middlesex P.S. Lecturette Competition.

Friday, March 24.

Partick Camera Club. "The Art of Picture Making." Dan Dunlop.

THE ROYAL PHOTOGRAPHIC SOCIETY.

The annual general meeting held on Tuesday evening last, with the President, Dr. G. H. Rodman, in the chair, was opened by a discussion as to whether smoking should be allowed at the meetings. The conclusion arrived at was to allow smoking at any meeting except those at which lantern slides were to be shown. The President then suggested that the report of the Council should be taken as read and discussed paragraph by paragraph.

One member very kindly suggested that the salaries of the secretary and his staff should be increased, but as there was a slight deficit on the balance-sheet, owing to a large number of members having not paid their subscriptions, this suggestion was said to be rather difficult to carry out.

It is gratifying to note from the report that the Journal is now being published in eleven monthly issues instead of eight, and that the advertising department has been transferred to the Society's

house. Many thanks are due to Mr. George E. Brown for his many valuable suggestions and advice.

With regard to the annual Exhibition, it was announced that it was hoped to have an improved method for showing lantern slides and Autochromes at the next Exhibition.

A vote of thanks was passed to Miss M. Talbot for the addition of many interesting pieces of apparatus to the Fox-Talbot collection. Referring to the Fox-Talbot Memorial, Dr. Rodman said that he thought it might take the form of a lecture or scholarship open to members of the Society, and that further contributions would still be very welcome.

A very valuable contribution to students of photography has been the production by the Scientific and Technical Group of "Photographic Abstracts," under the able editorship of Mr. B. V. Storr, M.S.C., F.I.C.

The Pictorial Group which was formed during the year is also going strong.

Votes of thanks to the officers and staff followed, and Mr. J. B. Portway then read the report of the scrutineers of the ballot for the election of members, which had resulted as follows:—

President

Mr. W. L. F. Wastell.

Vice-Presidents.

Mr. J. Dudley Johnston.
Mr. F. F. Renwick, F.I.C., F.C.S

Hon. Treasurer.

Mr. E. W. Mellor, F.R.G.S.

Ordinary Members of Council

Marcus Adams	Thomas Illingworth, J.P.
A. C. Banfield	Ernest Marriage.
A. J. Ball.	F. Martin-Duncan, F.R.M.S.
Capt. D. Cameron-Swan, F.S.A.	C. H. Oakden, F.R.M.S.
G. Bellamy Clifton.	T. Slater Price, D.Sc., F.I.C.
Bertram Cox.	T. H. B. Scott.
C. Pollard Crowther.	W. F. Slater, F.R.G.S.
W. B. Ferguson, K.C., F.I.C., M.A.	J. C. Warburg.
G. I. Higson, D.Sc., F.I.C.	G. C. Weston.

The retiring president, Dr. G. H. Rodman, then introduced the new president, Mr. W. L. F. Wastell. As Mr. Wastell is a well known member of the Society, he did not, as Dr. Rodman said, require any introduction to the Society. Mr. Wastell then called upon Mr. T. H. B. Scott to propose, and Mr. G. C. Weston to second, a vote of thanks to the scrutineers, which was carried unanimously. Messrs. Calder, Marshall and Ibotson were re-appointed auditors, and are to receive an honorarium of eight guineas instead of five for their services, and with this business the president declared the meeting closed.

EDINBURGH SOCIETY OF PROFESSIONAL PHOTOGRAPHERS.

Meeting held at 116, Hanover Street, Edinburgh, on Monday, March 6. Present: Mrs. MacKay, Miss Bertram, and Messrs. J. Campbell Harper, John Thomson, E. D. Young, William Fergusson, W. B. Hislop, George Balmain, W. J. Hutcheson, P. S. Moffat, Aikman, Johnston, Bambrick, and Swan Watson. Mr. J. Campbell Harper (President) in the chair.

The meeting unanimously appointed Messrs. Balmain and Fergusson as members of the Committee to conduct Class Examination at the College of Art. The Secretary read a letter from Mr. George J. Hughes, photographer, of Bridge-of-Allan, requesting to know if he would be eligible for membership of the Society. It was pointed out that by the present constitution he was not eligible for membership, but the Society would be delighted to admit him as a member as soon as the constitution was altered at a general meeting to be held in May.

Mr. Swan Watson reported the result of his visit to the College of Art, and gave the impressions he had received from his visit there. In his opinion the training which the pupils were receiving at the hands of Mr. E. D. Young was excellent. Mr. Campbell Harper also expressed himself as being favourably impressed by his visit to the College, and spoke of the benefits which the pupils were receiving from the tuition at these classes, giving as an example work done by an assistant the previous week. A photograph of a gentleman, deceased, was brought in for enlarging, with alterations. The original photograph showed the gentleman with a hat on and in shirt sleeves, in a garden. A copy negative was made, the hat blocked out and a small enlargement made, and from another snap showing the hair, the assistant drew on the hair, and put a coat on, the result being most successful. This young assistant had less than two winters at Mr. Young's drawing and retouching classes.

A long discussion then took place as to the desirability of holding a Congress and extending the membership. Several members gave their views on the matter, and ultimately it was resolved to extend the membership to those carrying on business in the country, and that when the constitution of the Society fell to be altered a rule would be added accordingly, whereby the area would be extended and country members admitted to the Society. It was resolved to take the opinion of the Glasgow Society on this matter, and Messrs. Harper and Young were appointed to go to Glasgow on an early date and discuss the whole matter with the Society there.

With regard to holding a Congress, Mr. Moffat stated that the idea was that a hall should be rented where an exhibition of professional work would be held. Photographers would also be able to take space and show their work separately. Several of the large dealers had intimated their intention of taking stands. The question was discussed as to the exclusion of amateurs from the lectures and demonstrations, and the general opinion of the meeting was that these should be only for members of the Congress, who would be admitted on showing their badges. Further information was necessary, however, before the Society could decide as to how the Congress should run, and it was resolved to continue the discussion at a subsequent meeting.

News and Notes.

Portraits on Travellers' Advices.—A writer in one of the evening papers says that travellers' advices should not be complete without a photograph depicting "our representative who will have the pleasure of calling on you."

Press Photographers' Wages.—A Trade Union newspaper states that negotiations are in progress with the Press Photographers Proprietors' Association for a new agreement, that the situation is not satisfactory, and "unless a more conciliatory spirit is manifested a serious situation may shortly arise."

Photography in Washington Museum.—We learn from our American contemporaries that the National Museum at Washington has one large and well filled room devoted to the history and progress of photography. Here the interested visitor may find a little of anything and everything photographic; old Daguerreotypes, plain silver, carbon, platinum and other prints, apparatus such as is never dreamed of to-day, motion picture machines, early methods of cameras and apparatus, modern pictorial work, airplane cameras, process cameras and lenses, colour photographic exhibits, etc. Fine as the collection is, however, it is not complete; there are gaps in the line of exhibits, and an appeal for more photographic material is being made.

Photographs in Old World Cottage Decoration.—Writing on the furnishing of thatched old-world cottages, a writer in the "Daily Chronicle" says:—"Photographs should never hang upon the walls of an old world cottage. Some people cling to examples of the photographic art and like portraits 'about them,' but they look out of place amidst old china and pictures. A woman with exquisite taste for furniture combined with sentimental leanings towards photographs of relations and friends solved the problem in quite a novel way. She had all photographs in standing frames and kept them in a bureau drawer. Each day she put one out, substituting it for that which had looked upon the world the day before. In this way they were all given the honour of gracing her small and well polished occasional table. Another woman revived the old fashioned album beautifully disguised in modern tooled leather, and all photographs were kept in this volume."

Exhibition at Morley.—The Morley Amateur Photographic Society having been given an oxydised silver shield by the residents of the town to be competed for annually, the council, at a special meeting held on March 9, decided to hold an exhibition and competition which will be open to all amateur photographers who are residents in England, Scotland and Wales, from April 22 to 29 next, when the following prizes will be given:—The shield,

which is to be held by the winner for twelve months and then returned to the society, also a silver oxydised medal and £1; a second price of 15s.; and a third prize of ten shillings. The judges for the competition will be Mr. Harold G. Grainger, of Leeds, and Mr. Harold A. Crawford, president of the Leeds Photographic Society. The latest closing date for entries will be April 14 next. Entry forms and particulars may be had from Mr. R. Spence, 26, South Queen Street, Morley, near Leeds.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspnodents.*

IMPROVING CAMERA CASES.

To the Editors.

Gentlemen,—In reply to Mr. T. P. MacNally, allow me to say that the Thornton-Pickard Company studded both the case and the reflex camera supplied to me. The case, which is of the attaché pattern, besides having good-sized studs on the bottom, is also studded at this side. The camera base is also treated in a like manner. It is a splendid idea which I have very often appreciated.—Yours faithfully,

W. J. Wray.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

B. R.—We have never heard that the big shipping companies have photographic service on their vessels.

W. H.—The screens are made by Kodak, Ltd. (Wratten Division), Kingsway, London, W.C.2, who will send you, on request, a booklet describing them.

P. G. J.—Any good ready-made distemper is suitable, or you can use the Vanguard "Kalko" background paint, which is made in black, white and grey.

V. J.—Providing films are carefully handled, that is, not rubbed against one another, a waterproof ink is fairly satisfactory, as is also a copying-ink pencil.

L. E. D.—The reports are at the moment a little confusing owing to rivalry of establishments issuing them. Some time must elapse before the matter can be definitely decided.

B. J.—We are unable to name a firm undertaking the special work you require, but would suggest that you apply to Messrs. Jeffery and Boarder, 55-56, Mattock Lane, Ealing, London, W.13, who may be able to help you.

B. J. B.—We think it would require a lawyer of experience in corporation law to answer your question. You must not put much value on our opinion, which, however, is that it is extremely doubtful if you can claim any compensation in respect to the publication of your first offer.

C. H.—We can suggest no use for the spoilt cards. Damp gaslight cards may often be made to give a passable print after warming well before exposure, either before a fire (the cards being kept in their original packets) or by placing each card on a hot water bottle in the dark-room.

T. R. F.—The standard book on the subject is "Ferric and Heliographic Processes," by George E. Brown, which is out of print, but you could possibly obtain a copy from Messrs. Foyle, 121-123, Charing Cross Road, W.C.2. The true-to-scale gelatine process (with several others) is fully described in the "British Journal" for July 19, 1918. Our publishers can supply this issue on receipt of 5d. in stamps.

C. B. E.—Yes, if you do not trade under your own name you are required by the Registration of Business Names Act to register your business. The office of the Registrar is at 4, Clement's Inn, Strand, London, W.C.2. The cost of registration is 10s. Under the Act you have to put your true name on "all essential business stationery," but you do not require to put your name on mounts of photographs nor to display it in or about your place of business.

G. H. E.—We suggest that you write, stating your requirements, to our agents in Japan, Messrs. Maruzen Co., Ltd., 11-16, Nihonbashi Tori Sanchome, Tokyo. We have no doubt that they would be able to pass on your letter to a firm of the kind you are seeking. We suppose you wish to get in contact with a wholesale firm supplying photographs and mounts to photographers in Japan. But that is by no means clear from your letter. In writing to our agents, who read English perfectly, you should be more explicit.

N. R. D.—The sulphide solution has nothing to do with the spots upon your cards. On examining the bleached prints with a magnifier they were plainly visible. The card "A" was then treated with sulphide solution one-third the strength you used, and that marked "B" was redeveloped to black with amidol. This was very much worse than the toned picture. Both are worse than the toned cards you sent. If you find that your black and white cards are free from spots we should attribute the trouble to hypo dust coming in contact with the prints between bleaching and sulphiding. If the black and white ones are spotted then the fault is probably due to the cards having been spoiled by damp.

D. A.—It is rather difficult to give an exact formula for distemper, as the quality of the materials has an influence on the consistency. An average would be two balls of whiting dissolved in about half a gallon of water; when quite smooth squeeze in a little laundry blue until the mixture has a pale blue tint, then add 1 lb. of double size dissolved in an old saucepan. Stir vigorously, and leave till quite cold. The mixture works much better if left till partly decomposed; that is to say, when it has a decidedly unpleasant odour. An easier way is to use the Vanguard Company's white "Kalko" background paint, which only wants mixing with cold water. We can say from experience that this does not rub off.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3229. Vol. LXIX. FRIDAY, MARCH 24, 1922. Price Fourpence.

Contents.

SUMMARY.

A contributed article by Mr. Mervyn Thompson outlines a competition scheme as a suggested means of reviving business in portraits in a given town if it is possible to secure collaboration of other trading firms. (P. 167.)

Working instructions for providing a studio or reception room with a wall covering, which forms an effective substitute for oak panelling, are given by a contributor to "Assistants' Notes." (P. 172.)

At the annual general meeting of the Professional Photographers' Association it was stated that the September Congress will, in all probability, be attended by Mr. Pirie Macdonald and by Mr. J. C. Abel, secretary of the American Association of Photographers. (P. 177.)

When the copyright in a photograph has been infringed, it is not a good defence for the infringer to say that he thought the copyright belonged to somebody else; according to the Act the admissible plea is that he had no reason to suspect there was any copyright at all in the photograph. (P. 166.)

Enlargement of part of the negative, so frequently done in the case of landscapes, often has its advantages in the case of portraits. (P. 166.)

In the production of booklets setting forth the attractions of hotels in pleasure and health resorts special care in the photography and in the letterpress printing will make an immense difference in the business value of the prospectuses. (P. 165.)

In a leading article we deal with the causes of the chief descriptions of spots which are liable to occur through faulty manipulation of bromide paper. (P. 166.)

Mr. Edgar H. Booth, B.Sc., in an article in the "Australian Photo-Review," gives a formula for a concentrated one-solution metol-hydroquinone developer, which has been found very satisfactory for plates, papers and lantern-slides. (P. 168.)

Mr. J. I. Crabtree, in a further portion of his paper on the testing of developers, deals with the comparison of developers as regards fog, keeping qualities and colour of image. (P. 170.)

At the Royal Photographic Society on Tuesday evening last it was announced that Mr. E. F. Renwick, who for many years has been chief scientific chemist for the Ilford Company, is leaving for America in the course of next month, and is joining the Du Pont de Nemours Company. (P. 176.)

Professor Namias has recommended formulæ in modification of the Ferguson process of copper toning by which prints of brown or warm-black tone are obtained. (P. 165.)

A correspondent calls attention to a peculiarity in the action of the permanganate reducer (P. 179.)

EX CATHEDRA.

Modified Copper Toning. Some variations in the customary Ferguson process of copper toning are recommended by Professor R. Namias, of Milan, an experimenter whose modifications of various existing methods reach quite a respectable total. The prints are first toned in the usual bath of copper sulphate, potass ferrocyanide and soda citrate, but Namias lays especial stress on the purity of the last-named. The citrate should not be alkaline, as some samples are, and, on the other hand, if too acid, causes the toning bath to become muddy sooner than it should. One variation, or rather extension, of the process is to transfer in full daylight the fully toned and washed prints to a metol-hydroquinone developer containing 2 gms. of bromide per litre. The silver ferrocyanide in the toned image is thereby reduced to silver, agreeably modifying the tone. Lightly developed prints should be used, as the process intensifies. A second variation is to treat the copper-toned print with a 1 per cent. solution of caustic potash or soda, the effect of which is stated to be the formation of a violet-coloured oxide of copper in the image. The print is then placed, in full daylight, into a developer, by which again the silver ferrocyanide is reduced, the resulting print being of pleasing brown colour. If the copper toning be carried out partially in the first instance, the resulting tone is a warm black. Unlike the modification already mentioned, the process has not an intensifying effect.

* * *

Hotel Photographs. There is still a good deal to be done by photographers undertaking the supply of photographs for booklets descriptive of hotels in the way of persuading proprietors of the value of creating the best impression upon recipients of the booklet. One has only to write, for example, to half a dozen private or residential hotels in any popular resort in order to obtain a useful demonstration of the effectiveness of good photography allied with good printing in comparison with the unconvincing story told by a booklet in the production of which one or other of these essentials has been neglected. Photographers who have the opportunity of seeking work of this kind will be well advised to make a little collection of good and bad examples. It is astonishing to what extent in many cases a chief attraction of the seaside resort, namely, sunshine, is neglected. No need to think that sunshine needs to figure only in exterior views; the attractiveness of a bedroom or sitting-room shown in a flood of sunlight is something which makes an irresistible appeal to the would-be visitor from the smoke and fog of great cities. Much of the effect of photographs which are attractive in this and other respects is, however, liable to be lost by an unsuitable process of reproduction. The photographer ought to make it his business to persuade the customer of the advantage of letting him take charge of the whole job—printing as well as photography.

Half-tones printed, for example, in brown or sepia, and mounted on thin art papers of appropriate colour, form an illustrated prospectus infinitely more powerful as a bringer of visitors than the same prints reproduced in ordinary printing ink on a white paper. Given ideas of what is effective for the special purposes of the hotel proprietor, photographers will have no difficulty in obtaining appropriate printing from firms such as Messrs. Hood or Walter Pearce & Co., both of whom have made a specialty in the printing of booklets of which photographic reproductions form a large part.

* * *

Selection in Enlarging. The average portraitist often makes negatives which, although defective for some reason, such as careless centring upon the plate or an unnoticed error in posing, are still capable of yielding an artistic result if the offending portion be omitted and the remainder enlarged to such a size as will produce an effective picture. A little extra work may be incurred in doing this, but the photographer who has ideas beyond that of supplying his customer with the requisite number of more or less satisfactory prints, will not grudge this if he can make something better than the other poses of the sitting. Now that we have enlargers which are almost, if not quite, automatic in their action, the extra work is very slight, and the financial result will probably more than justify it. We fear that there is not yet a sufficient recognition of the value of the slow papers which yield warm black tones by simple development when used for enlarging. A strong illuminant is necessary, and fortunately this is available in the small enclosed arc lamps which are made specially for projection. With these, exposures of only a few seconds are necessary with average negatives, the current being taken off the ordinary wiring as used for incandescent lamps.

* * *

Innocent Infringement. The clear provisions respecting copyright, which are a feature of the present Act, have had the result, at any rate so far as photographs are concerned, of very greatly reducing the number of disputes which get as far as proceedings in the courts. Under the Act, the rights and liabilities of two people who may have been brought into conflict are sufficiently clearly defined as to avoid the necessity of the further legal expenses involved in taking the issue before a judge. In the comparatively few cases which have come into the Courts, that is to say, actions taken for infringement of copyright, it is curious to note that the infringer, while alleging his innocence, has almost invariably ignored the provision of the Act by which an innocent infringer is exempt from liability to pay damages, etc. According to Section 8 of the Act, it is a good defence for the infringer to prove that at the date of the infringement he was not aware and had no reasonable ground for suspecting that copyright subsisted in the work, instead of which it usually happens that an infringer puts forward as his defence that he thought the copyright belonged to some person (usually the person from whom he obtained the photograph) other than its real owner. Recently there was a case in an Irish Court in which most lengthy arguments were put forward for the defence on this latter basis, for which, however, there is no support in the Act. It may in fact be said that the loophole provided for the infringer by Section 8 is a very small one. Anyone having any business whatever in the reproduction of photographs may be expected to know that by the taking of the photograph copyright is created as the property of somebody, and that it lasts for a period of 50 years from the taking of the negative. Hence it is scarcely possible, in the case of a photograph of comparatively recent origin, for anyone to entertain the view that there is no copyright in it. The precise terms of Section 8 should be borne in mind by those whose copyrights may be infringed, since the pleas of innocence which are usually put forward fall to bits when examined in terms of the explicit provisions of this section.

SPOTS ON BROMIDE PRINTS.

The degree of mechanical excellence which has been reached in the coating of bromide paper has reduced to a minimum the probability of any spots which may appear upon prints being due to defects in manufacture. While defects in coating may occur occasionally, they usually manifest themselves as streaks or sharp lines, or more rarely as small uncoated patches. Therefore, in the case of small spots or very small irregular markings, we may usually trace the cause to some error in storage or manipulation. As in the case of plates or films, storage in a damp place gives rise to a multitude of small white or grey spots, varying in size from the finest pinhole to an eighth of an inch in diameter. These are more or less irregular in shape and usually unsharp at the edges. In such cases there is no remedy but to discard the remainder of the paper in use, although, if there is a large stock, it is not wise to do so without testing several packages, as one of these may have been in contact with a damp wall or shelf and others may still be in good condition. The trouble in this case is, of course, due to a partial decomposition of the gelatine, and this may arise at a later stage, with paper which is in good condition at the time of exposure, through excessive washing after fixing. This usually occurs in fairly warm weather, and then only when prints have been left in the water all night. It is obvious that in endeavouring to trace the cause of such a defect the prints must be closely scrutinised at intervals, in order to ascertain at what stage of the manipulations it arises. A small pocket magnifier is useful for this purpose, unless the investigator has unusually good eyesight.

Small white or grey spots of a circular or irregular oval outline, with sharply-defined edges, are usually due to tiny bubbles, which have prevented the developer from reaching the surface during a part or the whole of the time of immersion. These are often due to wetting the paper before development with water drawn from a high-pressure source, or by using developer which has been diluted straight from the tap and poured on the print straightway. When using very rough surfaced papers it is advisable to swab the surface with a pad of cotton wool immediately upon immersion in the solution. Development bubbles may be distinguished from bubbles in the emulsion coating by the fact that the latter show a thickened margin and a dull appearance in the centre. If bubbles occur in the fixing stage they will cause no apparent defect in black prints, although they will probably appear in a few weeks. They will, however, speedily manifest themselves as brown spots if the prints are sulphide-toned.

By far the greater number of spots are due to chemical dirt; that is, chemical substances in the wrong place. Amidol has a great knack of getting where it is not wanted, and most red or purplish spots are due to the presence of fine particles disseminated in the dark room while compounding the developer. Hypo is another offender which only makes its presence felt when toning is resorted to. It has been truly said that the dust of the dark room is hypo. If this were generally recognised many of the troubles of photographers would disappear. Taking the case of a sulphide-toned bromide it is easy

to see the havoc which hypo-dust can work. The bleacher almost invariably used contains a large proportion of potassium ferricyanide. This salt, combined with hypo, forms the well-known Farmer's reducer. If a print, wet with ferricyanide solution, is dusted with fine particles of hypo a reducing action is at once set up, and the patches affected either appear as white spots or as a lighter brown than they should be, according to the more or less complete solvent action of the hypo. The same thing occurs when prints hang together in the washing tank after fixing, but then the patches are larger and cannot be called spots. Here, the hypo is carried into the ferricyanide solution, and may not only damage the print which introduced it, but may slightly reduce others which follow. It is practically safe to assume that when toned prints show spots or markings, while black prints are free from them, hypo, in conjunction with the bleacher, is to blame. The trouble is not to be avoided by using any other bleacher than the bromide-ferricyanide formula, as practically all others reduce the silver into a condition in which it is readily attacked by hypo.

Small dark spots which appear only upon immersion in the sulphide solution are usually due to small air bubbles which have prevented proper fixation where they have been adherent.

Small blue spots sometimes appear on sulphide-toned prints; these are caused by particles of iron from the water-pipes re-acting upon the ferricyanide in the bleacher. The remedy is to tie a couple of thicknesses of washleather or close flannel over the nozzle of the tap. It is surprising to see what an amount of solid matter is collected in this simple filter in even a couple of days' ordinary work. Violet spots have been traced to particles of aniline colour distributed in the workroom in the process of sharpening a copying-ink pencil.

Spots arising from what may be called physical rather than chemical causes require little acumen to detect. An excess of retouching medium sometimes attracts and holds particles of dust. If this happens, the spots occupy the same position on every print. More rarely, dust is adherent to the sensitive surface of the paper, and frequently there are loose particles knocking about on the glass bed of the printing box.

A PROPOSAL TO REVIVE TRADE.

"The best laid schemes of men and mice gang aft agley" is an axiom that too often proves true. A scheme, however good, is liable to fail by reason of the miscalculation of one or another factor, or because that elusive quantity, public favour, has failed to respond.

A great London newspaper started an advertising scheme a short while ago, endeavouring to reform and improve upon the ugliness of men's headwear. Having found a design that was considered to be a great improvement, the thing was foisted upon the public, or at least the public was cajoled into adopting it. Much money was spent, the new hat was boomed, but "John Citizen," apart from a mild interest, and a mild amusement at the few brave souls who flaunted the new fashion, would have none of it. The scheme was dropped; it was a failure.

Even well organised enterprise will fail. To ensure success in a venture of this sort it is not only imperative to organise well, but the idea must fill a want, and, moreover, be one that is likely to catch the public fancy.

The scheme as outlined here is one that is intended to stimulate trade generally in any one provincial town; but particularly to help the professional photographer's business. It is a co-operative scheme and requires organising. Unless it is possible to secure enthusiasm, enterprise, and organising ability above the average it were better left alone. Conversely, the proposition is an attractive one, and is considered sound and good by certain city business men whose judgment is valuable, and who should be competent to give at least a sound commercial opinion.

Briefly, the scheme is a beauty, or bonnie baby, competition, that aims at gaining public favour and support by awarding prizes of such magnitude as to grip the interest and enthusiasm of the whole population. No one industry, confined in one particular provincial town, could afford to give a large sum of money in respect of prizes, particularly the photographic. It is therefore proposed to originate such an idea that will embrace all trades, and yet have the balance of the advantages thrown the way of the photographer.

To simplify explanation, I will commence by enumerating a proposed set of rules, explaining or excusing them afterwards, and then proceeding to describe the interests of the various trades, and how their co-operation is to be used.

Proposed Rules.

1. The competition is open to any child between the ages of six months and seven years, who has been resident within the boundaries of this town (or borough) for a period not less than six months prior to the date of the opening of the competition.
2. Parents, relatives, or guardians wishing to enter a child must obtain an entry coupon from a tradesman who is officially authorised to distribute such coupon.
3. Having secured an entry coupon, the parent, relative, or guardian, must present it to the photographer whose name appears thereon, for the purpose of having the child's portrait taken.
   (Judging will be by photograph and public ballot.)
   The photographer will photograph the child in accordance with such instructions as have already been laid down by the organisers, and will charge a fee of 10s. 6d. in respect of the photographic work. The photograph shall be such as meets the approval of the child's parents, relative, or guardian, and shall have affixed to the back thereof the entry coupon and a photographer's certificate bearing the date when the photograph was taken, the name, age and full address of the child entrant.
4. The parent, relative, or guardian shall deliver the photograph to the Competition Committee at ———— not later than ————.
5. Judging will be by public ballot. The photographs being exhibited upon the screen at the ———— Cinema upon dates that will be announced in the local press.

In the event of a large number of entrants, lots will be drawn, and photographs exhibited in groups. The child obtaining the largest number of votes passing into the next round, and so on. The child obtaining the largest number of votes in the final round being adjudged the winner.

There will be three prizes: 1st prize, £400; 2nd prize, £200, 3rd prize, £100, and ten consolation prizes of £10 each. The tradesman who supplied the entry coupon to the 1st-prize winner will receive £25 and the photographer £25. The tradesman who supplied the entry coupon of the 2nd-prize winner will receive £10 and the photographer £10, and the

tradesman who supplied the entry coupon to the 3rd-prize winner will receive £5 and the photographer £5.

It will be seen that in order to make a scheme of this sort possible a prize fund of £880 is necessary. Organising expenses should be negligible. The organising could quite well be carried out gratuitously by a committee of photographers. In a town of 50,000 inhabitants it should be possible to raise such a sum as £880, while larger towns might do more.

The Photographer's Part.

In a town or borough of 50,000 inhabitants there will be probably somewhere about twenty photographers. Assuming an entry of 2,000, each photographer would obtain 100 clients at 10s. 6d. A keen business man would recognise that this is only the beginning, and additional copies, enlargements, etc., would no doubt be supplied in many cases.

The photographs should all be standard; *i.e.*, cabinet size, rough mounted, full length pictures, against white backgrounds. This would curtail in some degree the photographer's art, but allow of a fairer judgment of the sitters. Photographers might easily subscribe £3 each towards the prize fund.

Other Traders' Interest

All other traders in the town should be invited to subscribe £1. For this he would receive a definite number of entry coupons, to be given away (upon request) to any of his customers spending £1 or more upon his goods. The coupons should have a photographer's name printed upon them. Each photographer being allocated the same quantity. The larger stores could be invited to subscribe more than £1, receiving proportionately a larger quantity of coupons. The atmosphere to be created is that the trade is conferring a favour in supplying the coupon, or that the coupons cannot too easily be obtained.

A definite trial only will show how much money it would be possible to raise in this way, but from £700 to £800 should not be impossible.

The Cinema's Interest.

The assistance of the largest and best equipped cinema should be enlisted The entrants' pictures would be shown upon the screen each bearing a number. Patrons upon entering the hall would be provided with a small cardboard disc, or token, and asked to drop it in that ballot box bearing the number corresponding to the picture of the entrant they wish to favour. With a large number of entrants, and voting being extended over several weeks, a good deal of business would be attracted. The proprietors of the cinema, who would certainly be willing to bear the cost of lantern slides, may conceivably be persuaded to subscribe £100 to the prize fund in addition.

The Local Newspapers' Interest.

The local newspapers could without difficulty be induced to give all the publicity required. The cost of printing the entry coupons may also be considered, offering the newspaper the opportunity to advertise themselves thereon, if supplied without cost.

Such an undertaking properly organised, with keen business brains behind it, would stand a reasonable chance of obtaining the public interest and support. It would be of such a nature as to risk the least possible dissatisfaction upon the part of the unsuccessful public; it should stimulate trade generally; arouse a mutual interest between trade and clientele; would benefit all in some degree, and cost individually comparatively nothing.

The suggestions made are general ones. Individual towns may find it unworkable or unwarranted. Modification may be necessary, and there may arise numerous details that would require thought and careful handling.

Trade is bad, there is no use blinking the fact. The Government recognise that extraordinary methods are necessary in order to revive trade, and a Government financial department is now operating in the City (*i.e.*, The Trade Facilities Act Advisory Committee). When times are really bad it sometimes helps to fall back upon that primal instinct of mutual aid, and the proposals outlined in these notes are not so much a concrete plan to be followed, but rather a suggestion within which may be found a practical idea that may help to rejuvenate the photographic industry.

MERVYN THOMPSON.

A CONCENTRATED DEVELOPER FOR GENERAL USE.

[In the following article from "The Australasian Photo-Review," Mr. Edgar H. Booth, M.C., B.Sc., Lecturer in Physics in the University of Sydney, tells how to make up a concentrated developer for general use, and gives some notes on its employment.]

THE majority of photographers, both professional and amateur, who have progressed beyond the elementary stages have passed through the period when they required to have upon their shelves at least half-a-dozen different types of developer, or the means of making them. It is an interesting pastime, and very instructive—practice in manipulation is never time wasted. But we may use one standard developer which will give all desirable control—and it is better to be thoroughly familiar with the one solution rather than to have a slight knowledge of the peculiarities of many.

When we decide on one single developer for nearly all our work, we require it to fulfil certain conditions:—

(1) It must not stain the emulsion, nor the fingers.

(2) It must not cause chemical fog.

(3) We must be able to control it, so as to increase or decrease absolute contrast.

(4) It must be able to be manufactured and stored in highly concentrated form.

(5) It must keep well.

(6) The time spent in preparing working solutions from it must be short.

(7) It must be equally useful for plates, slides, gaslight, and bromide work.

(8) It must be composed of chemicals which are readily available, and not expensive.

This is not by any means an exhaustive list of requirements, but it sums up those that are of greatest interest to the ordinary worker. Other important requirements, so far as the scientific worker is concerned, are that one must be able to push development without causing blisters or frilling, and that it must be capable of being standardised.

A developer which satisfies the above conditions, and which I employ both in the laboratory for technical work, and outside for general photography is given below; the prescription has been passed on to a number of workers, who have found it to be quite satisfactory.

It is a one-solution M.Q. developer :—

	Metric System.	Apoth. System.
Metol	5.7 gms.	88 grs.
Hydroquinone ...	22.6 ,,	349 ,,
Water, distilled .	415 c.c.s.	14.6 fluid oz.

Heat the water to 50 deg. C. (112 deg. F.), and dissolve in it the metol and hydroquinone.

Add Soda sulphite

(anhydrous) ...	77.7 gms	1,199 grs.

Stir for two minutes. This will produce a greyish-white precipitate.

Add Caustic soda

(pure stick) ...	14.5 gms	224 grs.

Stir until all the soda is dissolved. The white precipitate will then have disappeared. Filter rapidly, and store for use.

If it is intended to make up developer to last for over three months, small bottles should be used to hold it. We make up our "Standard M.Q." into 8-oz. lots. But we have tested a 16-oz. bottle, using 4 ozs. per month, the bottles, of course, being kept stoppered when not in use. The developer grew gradually browner, but the oxidation was apparently so small a percentage of the possible amount that at the end of the four months a series of experiments showed the same times for stand and tank development to be satisfactory, and disclosed a total absence of staining.

Another point of interest in connection with this developer is that it contains no bromide—from a scientific viewpoint the presence of a bromide in a developing solution must have the effect of reducing the speed of the plate or film. In some tests which we made with this developer, using plates speed H. and D. 270 at time of exposure, on development they were found to function as plates of considerably lesser speed, according to the amount of potassium bromide added. (Down to speeds comparable with H. and D. 50.) This is, of course, an indication of procedure in cases of known over-exposure. Details as to the quantities of potassium bromide to be added are given later. Naturally, the addition of a bromide in the case of plate or film development is not recommended merely to enable fast plates to be used as slow plates—it does not alter the *size* of the silver grain. It is recommended simply as a means of correcting an error.

The Watkins factors for this developer are :—For soft pictures 13, normal 15, contrasty 18.

As with the majority of developers, the best temperature for working is from 60 deg. to 70 deg. F. We have used it at temperatures up to 90 deg. F., but naturally only under compulsion. As it is a developer with a caustic alkali, the rule should be to employ *always* a hardening bath if this will not interfere with subsequent work on the plate or paper—and if a hardening bath is not admissible, then not to develop at a temperature over 70 deg. F. The hardening bath employed is a saturated solution of potash alum, though the commercial acid fixing bath may be employed. Owing to a doubt as to the action of formaline on celluloid* the use of a formaline fixing bath is not recommended in the case of films.

The times for the following working strengths are for a temperature of 65 deg. F. :—

(1) *Plates or films.*—Standard M.Q. 1 part, distilled water 15 parts. Normal time of development, 4 minutes. For stand development.—Standard M.Q. 1 part, water 31 parts. Normal time of development, 8 minutes.

(2) *Bromide Papers.*—Standard M.Q. 1 part, water 15 parts.

(3) *Lantern Slides.*—Standard M.Q. 1 part, water 15 parts.

(4) *Gaslight Papers.*—Standard M.Q. 1 part, water 15 parts, to which add 1 drop of 10 per cent. solution potassium bromide per oz. of mixture for bromide effects, or 3 drops of 10 per cent. solution potassium bromide per oz. of mixture for black and white effects.

The test paper was Velox Glossy Regular. The times given for plates and films depend, of course, on the plate employed—it is best tested by the user himself with the material with which he normally works. If a slow tank development is desired, 15 minutes, in a solution 1 part Standard M.Q. to 63 parts water at 65 deg. F. will be found satisfactory. For extreme contrast in scientific work we push development until chemical fog begins, so as to get as great a density range as may be practicable. If we desire even greater contrast, as in the case of some line work, then we employ a strong bath of Farmer's hypo-ferricyanide reducer until the shadows are clear glass, without the high lights having been appreciably attacked. This is done prior to hardening. Probably 90 per cent. of our work may be done with the one developer—for after all the plate is only a means to an end, and M.Q. is fairly universally used for papers at present; so those photographers who do not care to go to the trouble of making up their own solutions are advised to keep to a single M.Q. developer, with which they may become familiar.

The only variations we make are the use of amidol, if we are to do much treatment of a particular plate and wish to avoid the use of the caustic alkali, and the employment of an M.Q.-Acetone developer where toned Velox prints are wanted direct.

For plates or films in cases of known over-exposure, add 5 drops of 10 per cent. solution potassium bromide as above per ounce of the solution Standard M.Q. 1 part, water 15 parts. If considerable over-exposure is feared, the amount of potassium bromide may be further increased. Develop fully, and reduce if necessary.

EDGAR H. BOOTH.

* A. Chargois, "B.J.," Dec. 19, 1919, p. 747.

THE PLASTOSCOPE.—Stereoscopic films have been a lode-star which has attracted cinema inventors for the past twenty years (writes the "Evening News" film expert). Several attempts and many near approaches to success have been made—notably the kineplastikon, which was shown at the Scala Theatre before the war—but they have not proved practicable. The Plastoscope, which was demonstrated last week, seems, however, to give a stereoscopic effect on the screen in a simple manner. It is an arrangement of prisms in a tubular attachment which is screwed on to the front of any projecting machine. The single picture projected by the machine is made into two by the prisms, and is sent out through two "eyepieces." Two distinct beams of light meet eventually on the screen and give to ordinary films a distinctly improved sense of "body" when seen on the flat screen.

PHOTOGRAPHING NOISES.—The lay Press last week published accounts of an instrument tested at Brooklands motor meeting by Dr. A. M. Low. The "noisemeter" (or audometer, to give it its technical name) was explained to some Press representatives by Dr. Low, who amused himself by photographing the bad coughs of some of his friends. "When you cough into the machine," he said, "it makes a photographic record. The sound impinges on a diaphragm connected with a very small mirror. When the diaphragm is oscillated by a sound wave the mirror rocks backwards and forwards. Then the spot of light is reflected from the mirror on to a sensitive film, which is moving automatically all the time, so that photographs of the noise-waves are taken as the air displacement occurs." Dr. Low (said the "Daily Chronicle" report) photographed at Brooklands the noises made by the cars as they took the strain of the steepest parts of the tracks. He has conducted some very fascinating experiments in London streets. "I have been photographing London noises for some time," he said, "and testing the effect upon the audometer." Omnibus companies have a special "noise" committee, and vehicles which have been repaired or constructed have to pass the committee's tests before being allowed to go out upon the London streets. The audometer is so sensitive that it detects and locates engine trouble.

PHOTOGRAPHIC METHODS OF TESTING DEVELOPERS.

[A communication from the Research Laboratory of the Eastman Kodak Company, reprinted from the "American Annual of Photography." The Elon mentioned, it may be stated, is metol (monomethyl paramidophenol sulphate) of Eastman manufacture.]

(*Continued from page* 156.)

Chemical Fog.

When comparing developers, we are only concerned with developer fog and not with fog inherent in the emulsion. Developer fog is caused by impurities or oxidation products of the developing agent formed during mixing. The importance of careful mixing of developers for test purposes is therefore apparent.

Interesting facts about fog are that the fog layer is not distributed evenly over the entire image, but is thinner in the high-lights because in those places where more image is developed, more potassium bromide is formed as a reaction product of development which therefore restrains the fog adjacent to the denser portions.

The absolute amount of fog depends on the volume of developer used. A film developed in a small volume of developer will have slightly less fog than if developed in a large volume, because in the former case the concentration of the bromide produced during development is greater.

Practical Determination of Fog.

Fog measurements are usually made by determining (*a*) the time required for fog to become just visible, and (*b*) the total fog density formed when development is complete.

(*a*) I. It has been found that a slow positive emulsion such as a lantern slide emulsion or motion picture positive emulsion, although very free from fog is very sensitive to the presence of impurities in the developer, and these emulsions are therefore very suitable for fog tests.

To make the test, first immerse one-half of the unexposed film in the developer and then, after one minute, completely immerse the film. Fog will therefore appear on the first half sooner than on the second half, and the time for the dividing line to become visible is taken as the fogging point.

(*b*) II. The total fog density is given by the density of the end or unexposed portion of the developed graded strip (Fig. 2). After the fog once appears its rate of growth is proportional to the time of development, that is, if the fog appears in two minutes and reaches a density of, say, 0.2 in four minutes, then the fog density in six minutes will be around 0.4.

The total fog formed after developing to an average contrast is usually proportional to the time of appearance of the fog, though as seen from the curve in fig. 5 it is possible that two developers in

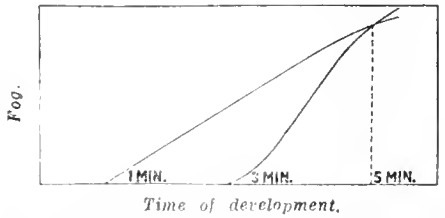


Fig 5 Curves showing the rate of growth of fog during development.

five minutes, say, might give the same fog but in three minutes the fog densities might be quite different. It is important, therefore, to consider both the time for fog and the total fog formed when development is complete.

Without a density measuring instrument the fog is most easily judged by laying the film, emulsion side down, on a sheet of white paper. With positive emulsions, such as lantern slides and motion picture positive film, no fog is permissible, but in the case of negatives, a very slight veil invariably forms by the time sufficient contrast is gained.

If a developer, which is otherwise satisfactory, gives excessive fog, the effect of the addition of a little potassium bromide should be tried before rejecting the developer. In the case of an energetic developer of the caustic-elon-hydroquinone type, bromide exerts a greater restraining action on the fog than on the image, so that increasing amounts of bromide should be tried up to, say, five grams per litre noticing carefully the effect on the lowest density and the density contrast of the graded test strip. If the fog is reduced to practical limits, and the density of the lowest step is not diminished to an extent equal to the original fog density, and if the density contrast is likewise not diminished, then the fog has been effectively eliminated.

Life of the Developer.

The active life of a developer is determined by

(*a*) The time required for the developer to oxidise by virtue of contact with the air, and, therefore, becomes useless either as a result of exhaustion or because of fog resulting from the oxidation products of the developer.

(*b*) The useful work which the developer will perform; that is, the number of films or prints developed when the solution is used continuously.

(*a*) The resistance of a developer to aerial oxidation is called the "keeping power" and is determined by measuring, say, 500 ccs. or 16 ozs. of developer into an open tray, allowing this to stand at room temperature, and making graded strip tests at frequent intervals, preferably daily. Before making the daily tests, the volume of developer should be brought up to the original five hundred ccs. with water, so as to compensate for loss by evaporation.

The keeping test should always be made in comparison with a standard known developer.

As the developer becomes oxidised, it usually turns dark brown in colour, though the rate at which a developer darkens in colour is no criterion of the rate of exhaustion, because some developers darken slightly the first day of exposure and do not darken further on keeping, though the developer might be totally exhausted on the third day. An unused MQ (Elon-hydroquinone) developer which on standing in a closed bottle turns slightly yellow and opalescent should be regarded with suspicion.

Keeping power is of great importance in the case of developers intended for use in tanks, such as in motion picture and amateur finishing work. It is of less importance for tray development.

If the developer refuses to develop after standing in an open tray for two or three days at 70 deg. F., it is useless for tank work. In the case of a developer with good keeping properties, the maximum density on the test graded strip will usually drop to about one-half in three or four days when applying the above test.

(*b*) The *useful* work test is made by exhausting the developer by developing a number of films or prints for a definite time in a definite volume of developer and noticing the time of appearance of the image and the point at which a change in colour or a weakening of the image occurs.

In practice, while the developer is being exhausted by virtue of developing the image, it is also being exhausted by aerial oxidation as a result of agitation, so that a strict exhaustion test could only be made by the impractical method of surrounding the developing tray or vessel with an atmosphere of an inert gas, say nitrogen, so as to prevent aerial oxidation.

The only final life test, therefore, is to exhaust the developer under actual working conditions.

If the developer oxidises rapidly an exhaustion test is not of much value, so that the keeping test should always be made first, and then an exhaustion test made if the developer appears promising.

Colour of Image.

The colour of the image is of most importance when developing paper prints and motion picture positive film. As a rule, Kodelon gives a greyish, hydroquinone a black, and amidol a blue-black image.

Tests for colour should always be made by cutting the test strips from a single sheet of film or paper, so as to insure that the tests are made on the same emulsion.

In the case of a negative, the colour is of less importance, because the quality of the negative is determined by the final print which it produces. The only coloured negative images met with in

practice are those given by pyro. Elon-hydroquinone images are termed "neutral deposits."

With pyro, the yellow stain, which is an oxidation product of pyro, may be distributed uniformly over the image, in which case the effect is the same as if a yellow filter had been placed over the negative, i.e., it increases the printing exposure. The stain may also consist of image stain, in which case each developed grain of silver is combined with more or less oxidation product stain, so that the pyro stained image is composite and consists of a neutral silver image and a yellow stain image, the latter image, therefore adding to the contrast.[4] It is for this reason that a yellow stained pyro negative gives a more contrasty print than an apparently similar negative developed in a non-staining developer. When comparing negatives developed with pyro, therefore, always compare prints made from the negatives and not the negatives alone.

For negative work, a developer is to be preferred which gives a fairly colourless deposit, because in the case of a pyro stained image the quantity of stain depends on so many factors, such as the time and temperature of the developer, the time of rinsing, the nature of the fixing bath, the time of washing, etc., that it is almost impossible to control the quality of the pyro stained negatives obtained. When judging two developers, one of which gives a neutral deposit and the other a pyro stained image, providing the two developers compare favourably as regards the capacity for rendering detail, fog, contrast, and keeping power, the developer which gives the neutral deposit or non-stained image is to be preferred.

Miscellaneous Factors for Comparison.

(*a*) *Effect of Dilution.* In many cases it is desirable to be able to dilute a developer so as to secure a certain contrast in a definite time, though, contrary to a popular notion, prolonged development with a weak developer does not always give better results than shorter development, say five minutes, in a stronger developer, and in many cases the results are inferior.

Pyro behaves normally on diluting up to three or four times; that is, the time of development is inversely proportional to the dilution, or if one volume of developer is diluted with, say, two volumes of water, in order to secure the same contrast the negatives should be developed for three times as long. The fog values for equal contrasts are likewise approximately equal.

A dilute developer, however, oxidises more rapidly than one which is more concentrated, the rate of oxidation being roughly proportional to the sulphite concentration. Sodium sulphite at strengths higher than 10 per cent. to 15 per cent. oxidises more or less slowly, but very rapidly at strengths below this. This is very apparent with developers intended for use with a reel and tank outfit. If the developer contains 10 per cent. to 15 per cent. of sodium sulphite, very little fog forms on churning up the developer, but if the developer is diluted with only 50 per cent. of water, fog may begin to form very rapidly.[5]

With Elon-hydroquinone the time of development is roughly inversely proportional to the dilution up to a dilution of one to three, though there is a tendency for the weak developer to give more fog than the stronger developer when developing to a given contrast. Beyond a certain dilution prolonged development does not increase contrast, because fog grows at a greater rate than the image.

A glycin developer will withstand more dilution than any other known developer and still behave rationally, and for this reason glycin has long been a favourite developer for tank work.

(*b*) *Effect of Temperature.* With developers such as hydroquinone development proceeds very slowly at low temperatures, so that a developer of this type, as compared with an Elon-hydroquinone developer tested under arctic conditions, would prove very unsatisfactory. For tropical work a developer is required which will not cause undue swelling of the gelatine or excessive fog.

(*c*) *Alkalinity.* A developer which is strongly alkaline shortens the life of the acid fixing bath, because the acid in the latter is rapidly neutralised by the alkali in the developer carried over by the films and prints, and under such conditions the films and prints are likely to become stained.[6]

Excessive alkali also tends to soften the gelatine film, so that, other factors being equal, a developer containing a minimum of alkali is to be preferred.

(*d*) *Cost.* The cost of the developer per unit of work performed is calculated by dividing the total cost of the developer (including labour) by the total area of the films and prints developed measured in square feet. A developer which is more expensive as regards chemicals, but which has a long life, is often cheaper in the long run, because the extra cost of chemicals is more than offset by the saving of labour and perhaps tie-up involved when mixing a new batch of developer.

(*e*) *Physical and Chemical Properties.* The solubility, colour, and crystalline form are of importance. A developing agent which is readily soluble in cold water and is white and crystalline is always to be preferred.

Developers of the monomethyl paraminophenol type are readily precipitated by a solution of sodium sulphite, which in many cases makes it impossible to prepare the developer in the highly concentrated form.

Practical Examples.

The following examples illustrate the methods of presenting reports on the various types of developers.[7]

1. Report on a Sample of Hydroquinone.

The sample was compared with a known pure sample of hydroquinone by first compounding the following MQ. formula with each sample:—

	Metric.	*Avoirdupois.*
Developing agent	5 gms.	75 grs.
Sodium sulphite (E.K. Co.)	75 gms.	2½ ozs.
Sodium carbonate (E.K. Co.)	25 gms.	375 grs.
Potassium bromide	1.5 gms.	20 grs.
Water to make	1 litre	32 ozs

Sheets of flashed motion picture positive film were developed in each developer side by side at 70 deg. F., and keeping tests made by exposing the developer for 24 hours in an open tray, taking care to dilute the developer to the original volume before testing each day in order to compensate for evaporation.

	Sample.	*Standard.*
Time of appearance	65 seconds	65 seconds
Time of appearance after 24 hours	165 seconds	160 seconds
Density in 6 minutes	1.94	2.00
Density after 24 hours	0.85	0.86
Time for fog at 70 deg. F.	11 minutes	12 minutes

The above results show that the sample consists of practically pure hydroquinone. Although the sample contains a trace of coloured impurity which produces a little fog, this would be negligible in practice.

2. Report on a Sample of Elon Substitute.

The sample was compared with pure samples of Elon and Kodelon (paraminophenol hydrochloride) by compounding the MQ. formula and testing on sheets of flashed motion picture positive film, as follows:—

Developing Agent.	*Time of Appearance.*	*Time for Fog at 70° F.*	*Density in 6 Minutes.*	*Fog.*
Elon	7 seconds	10 minutes	0.75	0.05
Sample	14 seconds	6 minutes	0.62	0.05
P. A. P. ..	30 seconds	16 minutes	0.49	0.03

From the above it is seen that the sample stands about half way between paraminophenol and Elon in its photographic behaviour. (Since the sample was so remote from Elon, it was unnecessary to make further tests.)

3. Report on the Developing Agent "X."

The developing agent "X" submitted consisted of light grey flakes, which were readily soluble in water and very readily precipitated by sodium sulphite. Preliminary experiments having shown that the developer behaved in a manner very similar to Elon, it was required to determine whether the developer became

4. See article on "Stains on Negatives and Prints," "Amer. Ann.," 1921, p. 204.
5. See article "Chemical Fog," "Amer. Ann.," 1919, p. 30.
6. See article on "Stains on Negatives and Prints," "Amer. Ann.," 1921, p. 204.
7. In the absence of a density measuring instrument the photographer can visually compare densities with sufficient accuracy by placing the two graded or flashed strips side by side, and examining the density of corresponding steps when looking through them against a uniformly illuminated light source such as a uniform sky. The lowest densities are best compared by laying down on a sheet of white paper.

exhausted at a greater rate than Elon. Developers were, therefore, compounded with equal weights of Elon and the sample "X," according to the MQ_0 formula, and sheets of flashed motion picture positive film developed in each developer for 7 minutes at 70 deg. F. The films were developed consecutively without loss of time so as to eliminate as far as possible errors due to oxidation of the developer, and the time of appearance noticed in each case. The results were as follows:—

	1st Sheet.		*10th Sheet.*		*20th Sheet.*	
	Time of Appearance.	*Density.*	*Time of Appearance.*	*Density.*	*Time of Appearance.*	*Density.*
Elon ..	5 seconds	2.5	12 seconds	1.5	40 seconds	0.98
Sample X ...	5 seconds	2.2	16 seconds	1.4	56 seconds	0.90

From the above tests it is seen that the sample X compares favourably with Elon as regards its photographic behaviour although the colour of the silver image produced was decidedly bluer than that given by Elon.

J. I. Crabtree.

(To be continued.)

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

Panelling the Studio.

It is the desire of many a young photographer to do away with the stiff panel background which ties him everlastingly to just one part of his studio and a certain run of accessories, and to have his walls panelled so that he may use any part of his studio that he desires, and get the same effect from the genuine walls themselves.

But, alas! in these days of enormous bills for labour and materials—especially labour—few will employ the British—or any other—workman except upon compulsion, such, for instance, as for burst water pipes, and even then dread the receipt of the attendant bill.

However, there is a way out of it quite as effective as the "modern" antiques so largely used by photographers in the way of furnishings, and this method, which any photographer can make use of, requires only care, patience, and just the few tools I will now describe. It entirely depends for its success upon the care with which the work is done in the first instance, so that it may present a thoroughly workmanlike appearance.

Either the whole of the studio walls may be panelled, or a portion only of them, as is preferred, but in any case it is useful to include two sides of the wall, having a corner, and including also a door or window, or both.

The first proceeding is to select and cover the chosen walls with a perfectly plain dark brown paper. This work the photographer can quite easily carry out alone. Wall-paper is sold in rolls of standard size—22 inches wide and 12 yards long. To discover how much will be needed, measure the height from floor to ceiling, and also the length of the skirting board of the part to be papered, allowing for all recesses and window spaces. From these measurements the decorator will easily know how many rolls to supply.

Having bought the required amount of paper, a bucket of plain flour paste will be needed. Buy a 2-lb. bag of plain—on no account self-raising—flour. This will make nearly a gallon of paste. The flour is mixed to a thin cream, perfectly free from lumps, with cold water, and boiling water is poured into this, with constant stirring until the mixture "turns" and becomes semi-transparent and jelly like. If there should be any trouble to get it to "turn," the whole may be put on the fire and boiled until it "turns," but it will need constant stirring to keep it from getting lumpy. A table-spoonful of powdered alum or a few drops of almond oil may be added—especially if outside walls are to be papered—to prevent mould, mildew, and consequent "peeling" of the paper after it is on.

If the walls are already papered, and they are not to be stripped, the old paper should be first carefully rubbed down with a stale loaf, and any torn places, cracks, etc., first repaired with slips of thin paper, allowed to stretch well before being applied.

The secret of good paper-hanging is to apply the paste freely and evenly, and allow the paper to get quite limp and well stretched before it is put on the walls, so that it may dry tight, smooth, and free from creases, particularly as in the present case, where it is intended to imitate the effect of woodwork. A useful brush for applying the paste is the short-handled kind, about 18 inches wide, used by housemaids for cleaning stairs; a regular paper-hanger's paste-brush is a fairly expensive article, and is not at all necessary.

Open out the roll of paper, and cut it off roughly at the proper length for the height of the studio, allowing a fairly full measure, as it must be properly trimmed at the bottom after it is on. The length is then pasted. Be careful that you see which is the right and wrong side (plain papers are very deceptive), and hold the length up in a loop, back to back, as it receives its quota of paste. This looping up makes the long, sticky length much less awkward to handle. Always hang from the top downward, carefully rubbing down with a big, soft pad of cloth or a roller squeegee, so that there may not be a single crease or cockly patch to betray the paper foundation. Corners need care and the use of a ruler lengthwise to make them look neat and secure perfect contact. Previous experience in wet mounting will guide the photographer in such work as this, and prevent it from looking home-made.

When this portion of the work is completed, if a good warm-toned brown paper has been chosen, the walls should present almost the appearance of being of perfectly plain, grainless stained wood.

Next the panels must be formed by adding plain deal battens from floor to ceiling—or to within 9 inches of the ceiling—and long cross battens horizontally, thus completing the effect of longish narrow panels. The battens should be made of long strips of deal, from 2 to 4 inches wide. They may be bevelled off on two sides if desired, though this is quite unnecessary, and I prefer the plain effect myself. The height and width of the panels must, of course, depend on the height and width of the individual walls, and how they can be divided up to the best advantage, to give panels of even and uniform size all round, and to reduce the labour to a minimum.

Long lengths of wood of a narrow width can be ordered from any builder or timber merchant, of the kind used by builders for making door and window frames, and thus avoid sawing; it is also better wood, and of a uniform inch or inch-and-a-half thickness.

The proper number of uprights should be first sawn from the lengths, being very careful that they are a perfectly tight fit. Then cut off the cross pieces required. If the photographer has any mechanical skill he can with a tenon saw and chisel cut out a half-inch notch in each length of the strips where they cross each other, so that when fitted in place they will form a perfectly flush smooth joint, a small screw serving to make all secure. If, however, this calls for too much labour the cross pieces must be cut into short sections, and each nailed into its place crossways between the long battens.

The entire lengths must be well secured in place with nails—the oval wire nails are less likely to split the wood—and any bad joints filled in with a little putty well worked in and smoothed over.

Quite an artistic effect can be obtained by leaving the top 9 inches unpanelled, as a frieze, and fastening instead a plain narrow shelf along the top, say 6 inches wide, on which can be stood brass or china ware. To make this perfectly secure it is first nailed to the uprights, and then above is fitted very tightly a cross length of inch square wood, which, when well hammered down, will make the shelf quite secure.

If there is already a skirting board around the panelled portion this need not be disturbed, but will, of course, need staining along with the rest.

All the woodwork in the white now being in place, it only remains to stain it to the desired colour. If it is to be varnished, it is as well to give both paper and woodwork a preliminary priming of size and boiling water, applied with a good-sized brush while still hot. If it shows signs of getting streaky, it should be heated up again.

A good plan, however, is to first go all over the white woodwork with a solution of permanganate of potash which has been dissolved in cold water and allowed to stand uncovered overnight. The oxidation thus caused does away with the pinkish colour that permanganate gives when first mixed, and usually makes a stain that will be found a very good match for the wallpaper already

put on. The ready-made stains can be used instead if desired, but I find that they dry with almost too strong a gloss, which is apt to give disagreeable reflections when operating. Such a stain as Jackson's floor polish, however, if very largely diluted with turpentine substitute—this is quite good enough and much cheaper than turps at present—will also give a very good effect.

If for the sake of richness of appearance it is desired to varnish the paper, this should certainly have a first coat of size, and when this is thoroughly dry be given one quick coat of clear varnish This can be purchased in small quantities from any ironmongers', but it should be stated that the varnish is needed for wallpaper The effect of the size is to make the varnish go on quite smoothly and free from streakiness, and also to make it go further, as it does not dry into the paper so much as if used without the first priming.

If there is a margin of floor board showing between the wall and the edge of the carpet, it is as well to give this also a coat of the stain, so that the whole may harmonise, for dark walls and lighter floor boards look very ill-assorted.

Walls treated in this way photograph excellently, and with the advantage that sitter and camera can both be moved at discretion, and by the use of a little furniture of old-fashioned design exceedingly home like and effective studios can be obtained, well repaying the time and trouble expended by any photographer who does not feel justified in the expenditure that the erection of real panelling entails.—G. E. H. G.

Photo-Mechanical Notes.

Half-Tone Screens.

Particulars of a half-tone screen invented by Heinrich Illig, of 12, Michelstadt, Odenwald, Hessen, Germany, are given in a recent patent specification, No. 156,718, applied for under the International Convention in February, 1914, and granted in this country on February 16 last.

The screen consists of a glass plate *a* into the surface of which fields or recesses *c* are deepened by etching the recessed fields preferably having a square shape. They are filled up with any suitable substance of an opaque kind. The crossed lines *b* which border the fields *c* are transparent. The transparent lines may cross each other at any other angles than right angles, and in such case the fields *c* will have the shape of a parallelogram or rhombus.

If desired, the screen prepared as described may be strengthened by cementing or otherwise securing to it a backing or a front-plate of transparent material.

In carrying the invention into practice one or the other of the following methods may be employed

A net of crossing thin lines, destined to form the screen-netting, is transferred to the smooth surface of a transparent plate of glass.

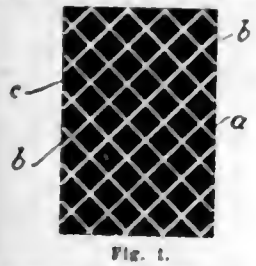


Fig. 1.

Fig. 2.

The screen netting transferred upon the glass consists of a suitable acid resisting paste, the print being preferably applied by an elastic printing plate or printing roller On spreading upon the plate of glass a suitable etching acid, the fields between the screen netting lines will be etched, while the lines protected by the print of paste, retain their original uniform height The deep etched fields or recesses then are filled up with a suitable opaque substance to an even uniform height flush with the transparent lines of the screen, and the printed lines are cleared of the paste by a suitable solvent, thus leaving a transparent netting of crossing transparent lines between opaque fields. The procedure may be the same as used in the offset printing process or in the line process.

According to another process a flat even plate of transparent glass is covered with a thin coating of wax, resinous matter, asphaltum or similar matter. Into this coating a net of crossing lines is traced laying the surface of the glass open where the lines have been drawn. The entire surface of the plate is then covered with a solution of silver or other plating metal of the kind employed in silvering or plating looking glasses, the solution adhering to the glass laid open in the lines of the screen while no deposit of the solution is formed upon the portions of glass covered by the coating of wax or the like. The coating is then removed by a suitable solvent, and the silvered or plated lines remain upon the glass. The squares or fields between the net of lines are deepened or sunk by etching the glass and the recesses thus obtained are filled up by an opaque substance. On removing the thin silver or metal coating from the lines of the screen, the lines are left transparent.

The following patents have been applied for :—

Lithographic Printing.—No. 6,237. Lithographic printing machinery. A. B. Evans

Lithographic Presses.—No. 6,241. Dampening mechanism for planographic or lithographic presses. Harris Automatic Press Co.

Lithographic Transfer.—No. 7,234. Preparation and treatment of photographic ferric films for lithographic transfer. H. L. Shawcross.

Exhibitions.

THE WELSH SALON OF PHOTOGRAPHY

was formally opened at the City Hall, Cardiff, last week, by Sir Thomas Mansel Franklin. Dr. W. Evan Hoyle, M.A., president of the Wales and Monmouthshire Federation, presided and described the exhibits, comprising landscapes, figure studies and portraits, as so excellent that it was difficult to distinguish the amateur from the professional section. Sir T. Mansel Franklin, Dr Hoyle mentioned, was himself a keen amateur photographer, and some of his works in book form were to be found in the Cardiff library In opening the exhibition, Sir Thomas traced the art of photography back to the days when Fox Talbot reproduced the first photograph. Photography, he said, was practised in Glamorgan as early as 1840 by Mr. Llewelyn, of Penllergaer, the speaker's uncle Alluding to the difficulty that the early photographer had to fight against, Sir Thomas said gradations of colour were unknown, a dead black and a dead white being the only colours at the photographer's command, and his capabilities were therefore sadly limited The discovery of isochromatic plates, however, proved the solution of this difficulty, and photography became firmly established

Mr. Henry Storm, chairman of the Federation Council, remarked with pride that one-tenth of the exhibits in the London Salon of Photography were contributed by Cardiff men.

Certificates were awarded to works by the following :—Open class, Hugo Van Wadenoyen, jun., H. Storm, W. Gilbert Scott, and J. A. Lomax (all of Cardiff). Federation class: Gwyn Morgan and T. J. Lewis (Barry), G. T. Frisk (Cardiff), and Aubrey Raymond (Neath), Beginners' section: Miss L. Wickett and A. Dure (Barry), and George W. Robinson (Porth).

FORTHCOMING EXHIBITIONS

March 4 to 25. South London Photographic Society. Particulars from the Hon. Secretary, Harry Abbott, 61, Beauval Road, East Dulwich, London, S.E.22.

March 27 to April 8. Dennistoun Amateur Photographic Association. Particulars from the Exhibition Secretary, Colin Graham, 448 Duke Street, Dennistoun, Glasgow.

March 28 to April 1. Hackney Photographic Society. Hon. Secretary, Walter Selfe, 23, Pembury Road, Clapton, London, E.5.

April 5 to 8. Leicester and Leicestershire Photographic Society. Particulars from the Hon. Secretary, W. Bailey, Cank Street, Leicester

April 5 to 8.—Faversham Institute Photographic Society. Latest date for entries, March 31. Particulars from the Hon. Secretary, W. H. Evernden, 116, West Street, Faversham.

April 21 to May 11.—Hammersmith Hampshire House Photographic Society. Latest date for entries, March 30. Particulars from the Hon. Exhibition Secretary, J. Ainger Hall, 26, Bishop's Mansions, Bishop's Park Road, London, S.W.6.

May 1 to 6.—Photographic Fair. Horticultural Hall, Westminster. Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1.

September 9 to October 7.—London Salon of Photography. Latest date for entries, August 30. Particulars from the Hon. Secretary, London Salon of Photography, 5a, Pall Mall East, London, S.W.1.

September 11 to 15.—Professional Photographers' Association, Princes Galleries, Piccadilly, London, W. (Trade and Professional). Hon. Secretary, Richard N. Speaight, 157, New Bond Street, London, W.1. Also foreign invitation loan exhibition of professional portraiture. Hon. Secretary, Marcus Adams, 43, Dover Street, London, W.1.

September 18 to October 28.—Royal Photographic Society. Latest date for entries by carrier, August 25. Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

Patent News.

Process patents—applications and specifications are treated in "Photo-Mechanical Notes."

Applications March 6 to 11 :—

REFLEX CAMERAS.—No. 6,676 Photographic reflex cameras. W. C. Adams and J. P. Glover.

CAMERA MOUNTINGS.—No. 6,494. Mountings for photographic cameras. G. W. Cooper and Stereo Kinema Syndicate, Ltd.

FRAMES.—No. 6,615. Photo or picture frames. Deakin & Francis, Ltd., and F. Shuttleworth.

COLOUR PHOTOGRAPHY.—No. 6,722. Colour photography. A. Hamburger.

COLOUR CINEMATOGRAPHY.—No. 7,096 Natural-colour cinematograph, etc., films and plates. J. C. Lyell.

CINEMATOGRAPHY.—Nos. 7,206 and 7,217. Cinematographic apparatus. G. S. James.

CINEMATOGRAPHY.—No. 7,033. Cinematograph apparatus. E. J Way.

CINEMATOGRAPHY.—No. 7,034. Apparatus for manipulating cinematograph film. E. J. Way.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

MULTIPLE IMAGES WITH ONE LENS.—No. 173,571 (September 6, 1920). In the known optical system shown in figs. 1 and 2, the rays of light passing through the camera lens 1 are split up by the semi-transparent reflector 2 arranged in the path of these rays. The reflector 2 is a mirror having bars 3 of reflecting surface alternating with transparent spaces 4. The strips 3 will reflect a portion of the light-rays transmitted through the lens 1 on to the reflector 5, which in turn reflects the light-rays on to the sensitive surface 6. The light-rays passing through the transparent strips 4 of reflector 2 are reflected by the inclined reflecting-surface 7 on to a similar reflector 8 and thence to the plate or film 6. The reflectors 5 and 8 are arranged on opposite sides of the axis of the lens 1 so as to produce two images upon the plate 6.

Fig. 3 shows the adjusting means for the reflectors arranged according to the invention. The various parts of the apparatus are mounted upon the inner face of the lens board 9, of a suitable camera. This lens board 9 carries the usual lens 10 with shutter 11 and behind the lens 10 is mounted the semi-transparent reflector 2 supported in a suitable frame 12 and secured by a bracket 13 to the inner face of the lens board 9. Beneath the

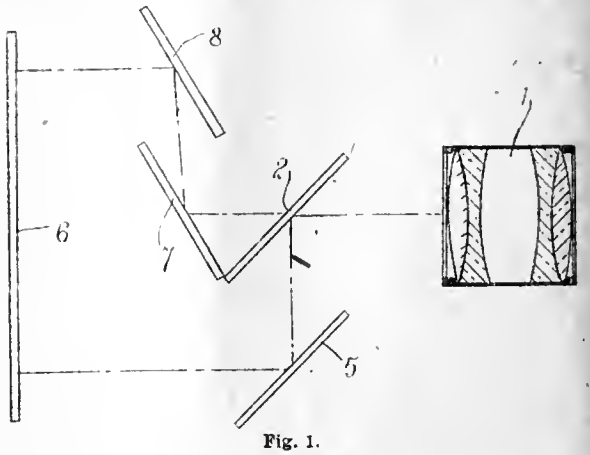


Fig. 1.

semi-transparent reflector 2 is arranged the reflector 5 mounted in a frame 14. This frame 14 is pivotally supported in arms 15 secured by their bent ends 16 to the inner surface of the lens board 9. The frame 14 carrying the reflector 5 may swing about its pivotal connection to the arms 15 so that its angle may be

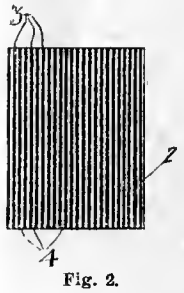


Fig. 2.

adjusted so as to receive the rays of light reflected from the semi-transparent mirror 2, and to reflect them again on to the sensitive film.

Behind the transparent reflector 2 is mounted the inclined

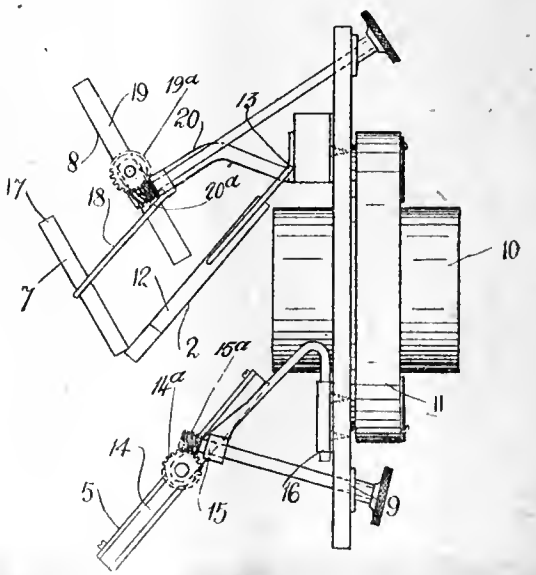


Fig. 3.

mirror 7 in a suitable frame 17. This frame 17 is supported on brackets 18 which are carried by the brackets 20 supporting the frame 19 of the reflector 8, which is arranged substantially parallel to the reflector 7. The brackets 20 are mounted upon

the inner face of the lens board 9. The position of the mirrors is such that the distance from the optical centre of the lens 10 to the reflecting surface of the transparent mirror 2, thence to the mirror 5 and on to the sensitive surface of the plate or film is equal to the distance from the optical centre of the lens to the surface of the mirror 7, thence to the mirror 8, and on to the surface of the sensitive film or plate. In this manner the distance over which the rays of light have to pass from the lens to the surface of the films or plate will be the same for both images formed, so that they will be substantially identical images and of a similar size. By turning the frame 14 in which the mirror 5 is mounted about its pivotal connection with the supporting arms 15, the angle of the mirror may be altered so as to move the position of the image reflected from this mirror. The frames 14 and 19 in which the reflectors or mirrors 5 and 8 respectively are mounted may be carried by spindles, at least one end of each of which is extended, and each of these extensions of the spindles carries a worm wheel 14^a and 19^a engaged by worms 15^a and 20^a, so that the relative angles of the reflectors with relation to the light-rays passing through the lens may be varied. The device may be applied to cinematograph cameras, in which case it is preferred to produce the two images upon the one film so that the images lie on top of each other but slightly out of register so as to produce a stereoscopic effect when projected. The pictures may also be arranged in pairs of separate pictures arranged one above the other so that upon being exhibited simultaneously through ordinary projectors a relief or stereoscopic effect will be obtained if the pictures are produced on the screen slightly out of register.—Reginald Killick and Hester Stewart, 152, Fulham Palace Road, London, W.6.

The following complete specifications are open to public inspection before acceptance :—

Reversal Processes.—No. 176,357. Photographic reversal processes. Kodak, Ltd.

Relief Cinematography.—No. 176,369 Cinematograph screens adapted to give to an observer the impression of pictures in relief. A. V. F. Marion.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

Carbine (Stork Design).—No. 421,863. Sensitised films for use in photography. William Butcher & Sons, Ltd., Camera House, Farringdon Avenue, London, E.C.4, manufacturers. December 28, 1921.

Kosmos.—No. 417,223. Photographic plates and films, and chemical substances prepared for use in photography. Kosmos Photographics, Ltd., Balfour House, Finsbury Pavement, London, E.C.2; manufacturers of photographic papers, plates and apparatus. July 25, 1921.

Velox (Design).—No. 421,046. Photographic papers. Kodak, Ltd., Kodak House, Kingsway, London, W.C.2, dealers in photographic materials. November 30, 1921.

Velox (Two Designs).—No. 421,423. Photographic papers. Kodak, Ltd., Kodak House, Kingsway, London, W.C.2, dealers in photographic materials. December 12, 1921.

Velox (Four Designs).—No. 421,045. Photographic papers. Kodak, Ltd., Kodak House, Kingsway, London, W.C.2. November 30, 1921.

MARKS PLACED ON THE REGISTER.

The following marks have been placed on the register :—

Kristal.—No. 416,794. Photographic dry plates. The Leto Photographic Materials Co. (1905), Ltd., 1, Crutched Friars, London, E.C.3; photographic manufacturers.

Planior.—No. 403,377. Lenses. Francisque Falsex, Route de Houdan, Auffreville par Mantes, Seine et Oise, France, manufacturer.

Lumex.—No. 404,988. Photographic cameras. Lumex, Ltd., 31, Dame Street, Dublin, Ireland, manufacturers of and dealers in photographic, optical and scientific apparatus.

Fairitype.—No. 407,027. Photographic enlargements. Adelphi Studios, Ltd., 60, Strand, London, W.C.2, photographers.

Retanol.—No. 408,222. Photographic chemicals. Johnson & Sons, Manufacturing Chemists, Ltd., 23, Cross Street, Finsbury, London, E.C.2, manufacturing chemists.

Petra.—No. 405,701. Photographic chemicals, plates and films. Petra Aktiengesellschaft für Elektromechanik, 18-20, Niederwallstrasse, Berlin C., Germany, manufacturers.

Carbro (Design).—No. 405,226. Chemical substances for use in photography. Walter Montague Rouse, trading as The Autotype Company, 74, New Oxford Street, London, W.C.1, manufacturer.

Sundora (Design).—No. 408,026. Photograph albums. Arthur Gill, 46, Sixth Avenue, Manor Park, Essex, company director.

Negopock.—No. 408,817. A folding photographic camera. The Russian Company for Foreign Trade, Ltd., 57, Shoe Lane, London, E.C.4, merchants.

Chat-tone Series (Design).—No. 409,389. Pictorial postcards, photographs and drawings. Frederick James Saxton Chatterton, 34, Elm Park Road, Finchley, London, N.3, artist and journalist.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

Monday, March 27.

Birmingham Phot. Art Club. Social Evening.
Bradford Phot. Soc. Annual General Meeting.
City of London P.S. "Portraiture with a Portable Light." C. Pollard Crowther.
Dewsbury Phot. Soc. Society's Coming of Age.
Kidderminster Phot. Soc. Result of Folio.
Leeds Camera Club. Rummage Sale.
Southampton C.C. "The Optical Lantern." G. T. Vivian.
South London P.S. Selected. E. C. Perry.
Wallasey Amateur P.S. Lantern Slide Competition.
Walthamstow P.S. Lantern Slide Making.

Tuesday, March 28.

R.P.S. (1) The Trist Three-Colour Exposure Camera, A. C. Banfield. (2) Two Papers dealing with the "Osglim" lamp and its use for photographic purposes. The General Electric Co., and Messrs. Ilford, Ltd.
Bournemouth C.C. "Granada and the Alhambra."
Cambridge P.S. "Niagara to the Sea." Dr. F. Robinson.
Exeter Camera Club. "Pictorial Ideals." M. O. Dell.
Hackney Phot. Soc. Annual Exhibition (to April 1).
Morley P.S. "How a Reflex Camera is Made." G. H. Jessop.
Nelson P.S. "Hints on Bird Photography." R. Wood.
South Glasgow C.C. Annual General Meeting.
South Shields Phot. Soc. Open Night.
Stalybridge P.S. Lantern Lecture. Travis Burton.
Tyneside Phot. Soc. Members' Exhibition.
Welfare Camera Club. Photographic Chemicals.

Wednesday, March 29.

Accrington C.C. "Irish Wit and Humour." A. H. Farrer.
Borough Poly. Phot. Soc. "Elementary Photo-micrography." Dr. G. H. Rodman.
Catford Camera Club. "Through the Grecian Archipelago." W. Butcher & Sons.
Croydon Camera Club. "The Possibilities of a Small Camera." E. Human.
Dennistoun A.P.A. "The Hillfoots." A. Shepherd.
Forest Hill P.S. "Flashlight Photography." J. A. Webberley.
Ilford P.S. "Dark Room Dodges." G. C. Weston.
Partick Camera Club. "The Optics of the Photographic Lens." James Devine.
Rochdale Amat. P.S. "How to Compose a Picture." A. E. Cooper.
South Suburban P.S. "Carbro Printing Process." Autotype Co.

Thursday, March 30.

Gateshead Camera Club. "With the Camera in Birdland." T. Donaldson.
Hammersmith Hampshire House P.S. "Photographic Necessaries." C. P. Crowther.
Letchworth Camera Club. "From Exposure to Mounted Print at High Speed." A. E. Bowyer-Lowe.
Liverpool Amat. P.A. "A Short Tour at the Italian Lakes." W. H. Gleave.
North Middlesex P.S. "The Way of the Lovely Sky." A. G. Buckham.
Wimbledon Camera Club. Lecture by W. S. Barrell and President's Competitions.

Friday, March 31.

Wombwell P.S. Exposing and Development.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, March 21, Mr. T. H. B. Scott in the chair.

The chairman announced that Mr. F. F. Renwick had resigned his office as vice president of the Society, consequent upon his leaving shortly to take up a position in the United States with the Du Pont de Nemours Company, of Parlin, N.J. The Council had elected Mr. T. H. B. Scott to take his place, and had further nominated Mr. Herbert Lambert as a member of the Council.

Mr. S. Bridgen then delivered a long lecture on "Landscape from the Practical Side." He dealt very fully with the equipment, materials and methods which he adopted in his own pictorial work, had some hints to give on composition in landscape photography, and, in fact, contributed a host of information on the practical side of pictorial landscape work.

A most hearty vote of thanks was accorded to Mr. Bridgen.

CROYDON CAMERA CLUB.

Mr. W. Sanderson, J.P., gave an exceedingly interesting lantern lecture on "Southern Italy," a subject, as the President poetically observed, particularly appropriate to the approach of spring, "When birds burst open and buds twitter merrily."

Mr. Sanderson rarely jumps abruptly from one important place to another, but in pleasantly conducted-tour fashion shows his audience intervening scenery, which establishes a nice feeling of continuity and rest. Perhaps the most interesting part of the lecture consisted of photographs of Messina taken before and after the last terrible earthquake in 1908, when many thousands lost their lives in a few seconds.

Technically, the only point of interest which arose related to exposure. In a good light in Italy he almost invariably uses one shutter speed of 1/100th second (presumably so marked), with a lens working at $f/6.5$, on fast, but not ultra-rapid, plates. Open views and narrow street scenes receive the same exposure measured in duration of time, and although the general quality of the slides was very good, some of the negatives certainly had not been surfeited with light-action.

This simple system sadly upset Mr. Harpur, who, in portly, portentous fashion, and, more in sorrow than in anger, admonished the lecturer. But subtlely he conveyed the idea that the amenities necessarily extended to an ever welcome visitor alone prevented his reduction to a small heap of ashes. Mr. Jobling found himself in agreement with Mr. Harpur, and imparted much information on exposure. Sad to relate, Mr. Sanderson remained unconverted and unrepentant. A most hearty vote of thanks was accorded him.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

Annual General Meeting.

The annual general meeting of the Association was held at 35, Russell Square, W.C., on Friday, March 10, 1922, at 6.30. Mr. Swan Watson (President) was in the chair, and there was a numerous attendance.

The minutes of the last annual general meeting and of the special general meeting having been confirmed,

The President referred to the death of the late Secretary, Mr. S. H. Fry. All who came into contact with him, he said, must have been greatly impressed with the wholeheartedness with which he did his work. His interest in the Association and in the profession was great and unselfish. As far back as the speaker could remember in photography Mr. Fry's name had been held in the highest respect. He thought the meeting would desire that this small tribute be put on record. (Hear, hear.)

The annual report of the Council was taken as read.

Mr. R. N. Speaight presented the annual balance-sheet. He thought that the Society's financial position was very satisfactory, particularly in view of the present depression. It was not quite so good a report as last year, but this was explained by the special circumstances under which the last Congress was held. It was held in the midst of great industrial upheaval, when most people thought them plucky in holding a congress at all, and considering that the loss on the Congress was only £17 the issue was very creditable to the Association. In the previous year the profit was something like £40, and this reversal from profit to loss on the Congress accounted for nearly all the difference—between £60 and £70—by which they were below the last year's record. There was a balance, being excess of income over expenditure, of £65, and another £100 had been added to the reserve.

Mr. A. Barratt asked a number of questions bearing on the accounts.

Mr. Speaight replied that the accounts were made up to December 31 last, on which date the old Association was in being. The expenditure on the "Circular" represented one issue. A new journal was being proposed, and would be issued shortly on a larger scale. It had been thought unwise to tax the accounts for one year only with the legal charges incurred in incorporation, and, therefore, while a sum of five guineas appeared in the statement of expenditure a similar sum in suspense was given among the assets, so that the expenses attending incorporation, which scarcely belonged to last year at all, might be more fairly distributed. The present price of the Association's investments was something like £15 above the cost price at which they were shown in the balance-sheet.

Mr. Barratt then moved the adoption of the report of Council and balance-sheet, and this was seconded by Mr. Chaplin Jones, and carried unanimously.

The President, in putting the motion, referred to the hours of labour which had been expended by Mr. Speaight as treasurer upon the finances of the Association.

Mr. A. Ellis (Chairman of Council) said that he wished to make it clear that this annual general meeting was a meeting of the old Association, not a meeting of the limited liability company. There were certain formalities which had still to be gone through, and until they were completed it could not be said that they were a fully fledged company. At that meeting they should be electing a President and Council, but under the provisions of the new Association it was arranged (Article 39, which he read), that they go forward into the new Association with the same President and Council as they had now. In addition to this statement he had to propose a resolution which had been drafted by the Solicitor as follows:—

"It appearing that the registration of the intended new Association has become effective, and that all the assets of the Association have been transferred to the new Association, and books handed over to the new Association, and there being no further usefulness in the continued existence of the Association, it is hereby resolved that the said Association be and at the same time is hereby dissolved."

He had much pleasure in moving that resolution.

Mr. F. H. Read seconded, and the resolution was carried unanimously.

Mr. Ellis then said that in order to have the general meeting at the Congress it was necessary that the present meeting be adjourned until the Congress in September, instead of being formally closed in the ordinary way. He moved, therefore, that the meeting be adjourned.

Mr. W. Illingworth seconded, and this was carried unanimously.

General discussion was then invited.

Mr. F. G. Wakefield asked what happened to those members who had not paid their liabilities to the old Association. Were those liabilities wiped out when the Association became the new body? He asked for the Solicitor's opinion.

Mr. Speaight (in the absence of the Solicitor) said that he could give the Treasurer's opinion, which was that they were still owing, and would be collected by all means.

The President suggested that at the Congress time might be spared for the discussion of some professional matters, such, for example, as the desirability or otherwise of putting into print the prices they might charge for commercial work. Many questions of the kind might be talked over informally at the Congress to their great mutual advantage, and he hoped that members would bring forward such matters for discussion.

Mr. Marcus Adams proposed that the best thanks of the meeting be given to Mr. Swan Watson for presiding. He said that Mr. Swan Watson had travelled from Edinburgh all the previous night, and was about to journey back that same evening, this representing no small sacrifice in the Association's interests. (Applause.)

Mr. T. C. Turner seconded the resolution, and said how much they had all enjoyed the able and delightful way in which the

President conducted their business. There was an instinct of happiness in him which was really contagious, and which affected the whole meeting.

Mr. Frank Brown, as a Past-President, cordially supported the vote. He had thought on many occasions that a man of their President's age——

The President: Only thirty-two. (Laughter.)

Mr. Brown accepted the correction, and went on to say that, however youthful he might be, the President was to be highly commended for his very regular attendance at the Council meetings.

The vote of thanks was carried by acclamation.

The President, in responding, recalled that he had a good Scotch aunt who used to pray, audibly, that the boy would be kept from getting conceited. He was afraid that that evening if she heard what was said she might fear that her prayers had been unanswered. Certainly it was an expensive business for a Scotsman to visit London. Bang went a good many saxpences! But it was a great pleasure to him to do anything for the profession he loved. If he had his time to come over again he would still be a photographer.

Mr. Lang Sims said that as this was the last meeting of the old Association, an occasion which brought a feeling of regret to many of them who had been members of the Association for many years, he thought that a vote of thanks should be given to the Council. He could propose this because, as Secretary, he was not a member of the Executive. Many of the members of Council attended at great personal sacrifice. It cost the President £10 every time he came. Yet there were members who would fling stones at the Council. Such members were unaware of the services which the Council put in on behalf of the Association. Their Chairman (Mr. Ellis), one of the oldest members of the Association, never missed a meeting. The London members of Council had special calls upon them, and often there were committee meetings, for which Mr. Speaight kindly lent his studios. He moved that a vote of thanks be accorded to the Council.

Mr. Frank Brown seconded, and the motion was carried unanimously.

Mr. Barratt asked for some announcement with regard to the Congress.

Mr. Lang Sims said that although matters were not ripe enough for definite announcements, he could assure the members that there would be some surprises. The Council was making a great effort to ensure a highly successful Congress. Another matter which the Council had decided only that afternoon was to bring out a journal, which would be a great advance upon anything in the past. The propaganda work of the Association was going forward very energetically. The preparations for the Congress were distributed among several committees, each with its appointed task, and the Congress would be something they would be proud of.

The President read a letter from the Photographers' Association of America extending to the Association in Great Britain a corresponding membership, which in effect would be that any member in good standing in the Professional Photographers' Association would upon presentation of his membership card be admitted on the same status to the members of the American Association, but without vote, and exempt from fee or dues, to any international convention of photographers in America. The next Convention of the kind was to be held in Kansas City from May 1 to 6, inclusive, and it was desired to have a representative exhibit of British work to show at this Convention.

Mr. Marcus Adams said that the collection of a suitable exhibit for this Convention had been entrusted to him, and he asked that members should send specimens of their work to him in sizes exceeding 12 x 10. He also mentioned that Mr. Pirie Macdonald was collecting one of the finest collections of portraiture to send to their own exhibition.

Mr. Reginald Haines said that Mr. Pirie Macdonald intended to come to their Congress and give them a lecture, also some other distinguished photographers from the States, including Mr. Abel, the Secretary of the American Association, a "live wire" if ever there was one. As for the American Convention, if any member could visit it, he would guarantee that he would get a reception that would live in his memory for the rest of his life.

This concluded the business of the annual general meeting, which stood adjourned. Mr. T. C. Turner then gave a short address and demonstration on up-to-date methods of electric lighting in the studio, a report of which is held over to appear in the next issue of "B.J."

Commercial & Legal Intelligence.

LEGAL NOTICES.—Notice is given of the dissolution, by mutual consent, of the partnership between Margaret Pickles and Julie Louden, carrying on business as photographers at 27, Central-drive, Blackpool, under the style of Louden and Pickles. All debts due to and owing by the late firm will be paid to or by Julie Louden.

NEW COMPANIES.

MACPHAIL, ADVERTISING SERVICE, LTD.—This private company was registered in Edinburgh on March 9 with a capital of £2,000 in 1,800 cumulative preference shares of £1 each and 4,000 ordinary of 1s. each. Objects: To carry on the business of advertising agents, stationers, lithographers, stereotypers, photographic and general printers, engravers, die sinkers, etc. The first directors are: W. A. Macphail, 91, Hyndland Street, Glasgow, advertising agent, and J. Barrowman, 248, Kenmure Street, Glasgow, advertising agent. Qualification: £10 in shares. Registered office: 29, Waterloo Street, Glasgow.

VEGA, LTD.—This private company was registered on March 8 with a capital of £600 in £1 shares. Objects: To carry on the business of manufacturers of and dealers in preparations for apparatus, plant, chemicals, and preparations for technical, commercial, photographic, manufacturing, engineering, scientific purposes, etc. The permanent and governing directors are: A. V. Elsden, 15, Coleraine Road, Westcombe Park, Blackheath, S.E.3, civil servant, and D. D. Jones, 17, Edmund Road, Hastings, officer in the Merchant Service. Secretary: E. E. D. Jones. Registered office: 518, Woolwich Road, Charlton, S.E.7.

ANDERSON, LTD.—Private company. Registered in Edinburgh, February 28. Capital, £300 in £1 shares. To carry on the business of photographers, photographic artists, print-sellers, fine art publishers, etc. The subscribers (each with one share) are: Carl Heinrich Theodor Schmidt, 34, Comely Bank Avenue, Edinburgh, photographer; Charles Smith, 34, Comely Bank Avenue, Edinburgh, photographer; Alexander Easton Hamilton, 34, Comely Bank Avenue, Edinburgh, jewellers' assistant. The first directors are C. Smith and A. E. Hamilton. Secretary: A. G. Bryson. Registered office: 58, Queen Street, Edinburgh.

H. LUSCOMBE TOMS & CO., LTD.—This private company was registered on March 8, with a capital of £3,200 in £1 shares (2,000 preferred ordinary and 1,200 ordinary). Objects: To adopt an agreement with H. Luscombe Toms and E. Bastard, and to carry on the business of photographic publishers, optical lantern slide makers, cinematograph film producers, scenic artists and painters, entertainment contractors, press photographers, manufacturers of and dealers in wet or dry plates, papers, films and transparencies, photographic materials, etc. The permanent directors are: H. Luscombe Toms, 52, Queen Victoria Street, E.C., lantern slide manufacturer (managing director); E. Bastard, 1, Dersingham Villas, Strathearn Road, Sutton, Surrey, photographer (assistant manager). Registered office: 52, Queen Victoria Street, E.C.

KEYSTONE VIEW CO. Particulars of the Keystone View Co. (Incorporated) were filed on March 7, pursuant to Section 274 of the Companies (Consolidation) Act. The company was incorporated in New York on January 6, 1920, to manufacture and deal in photographs, art prints, paintings, etchings, objects of art and artcraft, and all supplies in connection with the photographic business; and photography and pictorial service to newspapers. The capital is $130,000 in $100 shares. The British address is 1, Wine Office Court, Fleet Street, E.C., where B. Garai is authorised to accept service of process and notices on behalf of the company. The directors are: H. W. Sierichs and Emma P. Willey, of 91, Seventh Avenue, New York, and B. L. Singley, S. L. Hart, and F. M. Walrath, all of Meadville, Pa., U.S.A. The file number is 2,087F.

KINATICOL SYNDICATE, LTD.—This company was registered on March 13 with a capital of £25,000 in 20,000 10 per cent. cumulative participating preference shares of £1 each and 20,000 ordinary shares of 5s. each. Objects: To carry on experiments in natural colour and other photography, and the improvement of

processes connected therewith, and the business of producers and distributors of cinematograph films, etc. The first directors are: G. St. Lawrence Mowbray, Isfryn, Kew, Surrey, banker, and R. J. Watson, 8, Stonor Road, West Kensington, W., banker. Minimum cash subscription: Seven £1 shares. Qualification, after ordinary general meeting in 1923: £500. Remuneration: £100 each per annum (chairman £150) and a percentage of the profits. Secretary: A. Williams. Registered office: 57, Palace Street, Westminster, S.W.1.

Mayflower Syndicate, Ltd.—The Mayflower Syndicate, Ltd., has been registered as a "private" company with a nominal capital of £100 in 1s. shares. The objects are: To adopt an agreement between F. W. May of the one part, and Lieut.-Col. Sir Edward Bellingham, Bart. (H.M.L. for County Louth), C.M.G., D.S.O., and F. Bolton (on behalf of this company) of the other part, and to carry on in the United Kingdom or elsewhere (either directly or through the agency of any other company in which this company holds shares) the business of manufacturers, hirers, sensitisers, treaters, finishers, colourers, toners, letters on hire, renters, importers, and exporters or exchangers of all bases whatever, whether sensitised, partly sensitised or otherwise, on which photographs, pictures, outlines, designs, diagrams, etc., may be photographed, produced or reproduced, whether in colour or otherwise; manufacturers of and dealers in cinematograph projectors, cameras and apparatus, films, cinematographs, phonographs and sound-producing machines, musical instruments, etc. Permanent governing directors: Fredk. W. May (technical manager), Sheeps Head Bay, Long Island, U.S.A. (at present resident at 11, Passauerstrasse, Berlin, Germany); Lt.-Col. Sir Edwd. Bellingham, Bart., H.M.L. for County Louth, C.M.G., D.S.O. (chairman), Castle Bellingham, Ireland; F. Bolton (managing director), Anglo House, Litchfield Street, W.C. (managing director Anglo Film Agencies, Ltd.); R. A. Leckie, 23, Lime Street, E.C.; Elfreda M. Fries, 11, Passauerstrasse, Berlin, Germany; Capt. Chas. M. King, Guards Club, Brook Street, W. Qualification, 10 shares. Remuneration of governing directors (chairman £100 extra) shall be equal, and shall not be less than £200 over, above and in addition to that payable to each ordinary director. The registered office is at 1, Litchfield Street, W.C. File No. 180,077.

News and Notes.

Glass Works in Germany, says a Reuter correspondent, have decided to raise the price of glass made for dry plates by 15 per cent.

A Photographic Lady as J.P.—Mrs. M. W. Acworth, wife of Dr. J. J. Acworth, Ph.D., the photographic chemist and inventor and founder of the Imperial Dry-Plate Co., has been appointed as Willesden's first woman J.P. Mrs. Acworth (Marion Stevenson), who married in 1893, was also the first lady A.R.C.Sc.

Royal Institution.—On Thursday (March 30) Professor A. M. Hind delivers the first of two lectures on "Landscape Etchers: New and Old." The Friday evening discourse on March 31 will be delivered by Mr. A. B. Walkley on "Jane Austen"; and on April 7, by Sir Ernest Rutherford on the "Evolution of the Elements."

Royal Photographic Society.—At the meeting arranged by the Scientific and Technical Group, for Tuesday next, March 28, a paper on the Trist three-colour exposure camera will be read by Mr. A. C. Banfield. Two papers dealing with the "Osglim" lamp and its uses for photographic purposes will also be read by representatives of the General Electric Co. and Messrs. Ilford, Ltd.

Summer Time Dates.—An Order has been made in Council directing that summer time shall come into force this year at 2 o'clock, Greenwich mean time, on the morning of Sunday next, March 26, and shall continue until 2 o'clock, Greenwich mean time, on the morning of Sunday, October 8. This period has been fixed in accordance with the agreement made recently with France and Belgium to secure uniformity between the three countries.

Photography at the Zoo.—Dr. Chalmers Mitchell, secretary of the Zoological Society, lecturing at the Royal Institution last week, stated that many animals of which there were no photographic records were now quite extinct, and they wanted cinema records of every rare animal and every common animal, so that they might have them preserved for the future. At the Zoo they had an expert photographer, who took film records of all animals that came into their possession.

Size of German Picture Postcards.—According to a German correspondent on the staff of one of the London dailies you have to be very careful about the size of picture postcards in the Fatherland. You must measure your card very carefully, for some of the ex-King of Saxony's postcards, conveying birthday wishes to friends, were recently returned to the distinguished sender with the remark by a wide-awake Post Office official: "Too large to go at postcard rates." The ex-King's private secretary discovered, with the aid of the big book of Post Office Regulations, that they were one-thirtieth of an inch too broad!

Photographic Goods per Foreign Parcels Post.—Manufacturers of photographic materials and business men generally who have long been complaining that the maximum weight for parcels abroad—11 lb., and in some cases less—is not sufficient, have been wondering what are the "serious practical difficulties" mentioned in a recent Parliamentary answer. The G.P.O. authorities now state that the greatest obstacle to increase of weight is the fact that all parcels before they become "foreign" are "inland," whose weight must not exceed 11 lb. Before any change could be made, contracts with railway companies, fittings in sorting offices, the size of mail bags, and other factors have to be considered.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE FOX TALBOT MEMORIAL.

To the Editors.

Gentlemen,—I have recently received a letter from Miss M. Talbot, to whom we are indebted for the apparatus used by her grandfather and now included in our museum, where it is available for inspection, expressing the wish that the Fund collected should be, if possible, devoted to the endowment of an annual lecture *on photographic developments or on any kindred subject which might be helpful to practical photographers, whether professional or amateur.* (I underline the exact wording of her communication.) The Council of the Royal Photographic Society recently appointed the new President, Mr. W. L. F. Wastell, the Hon. Treasurer, Mr. E. W. Mellor, and myself to act as Trustees of the Fund, and in due course a scheme will be formulated for adoption later on, on the lines suggested by Miss Talbot.

May I add that the amount subscribed is gradually increasing, and that Mr. W. L. F. Wastell and Mr. G. C. Weston will be pleased to receive any further contributions sent to them at 35, Russell Square?—I am, yours faithfully,

Geo. H. Rodman.

March 18

MEASURING FOCAL LENGTH OF LENS.

To the Editors.

Gentlemen,—I have been interested in the paper by Messrs. Jobling and Salt on the Clay method of finding the focus of a lens. Unfortunately, however accurate the result may be, an appliance is required that is not in the possession of most photographers, and it would be interesting if the gentlemen named will apply themselves to the measurement of the foci of the lenses in most general use—the Petzval portrait lens, the aplanat of Steinheil, generally sold as rapid rectilinear and rapid symmetrical, an anastigmat

doublet, and the Cooke lens (the Aldis lens, having a special construction, might also be included)—and will take the measures also by the method in general use, and let us know the difference, so that the photographer may judge whether the amount is of importance. I have not now the conveniences for making these experiments myself.

The usual method, I suppose, is that which I published in the "British Journal of Photography," September 19, 1879, and was reprinted in the "B.J. Almanac" for many years in a useful page of optical calculations by Mr. Branfill. A concrete example of it was also adopted (this time without acknowledgment) by another writer. As these old papers may not be within the reach of many photographers, it may be well to re-state the rule. Focus the image of some object, say, a foot rule or a sheet of card with two crosses a foot apart marked upon it, to some definite scale. Suppose the foot is rendered as three inches upon the ground glass, the scale will be four to one. Measure the distance from the object to the image, multiply by the figure representing the scale, and divide the product by the square of a number, one higher than that by which it has been multiplied. Thus, supposing the distance from the original to the ground glass to be 50 inches and the scale four to one, $\frac{50 \times 4}{25} = 8$, and the lens has a principal focus of 8 inches.

—Yours, etc., W. E. Debenham.
Hampstead, March 13.

THE PERMANGANATE REDUCER.

To the Editors.

Gentlemen,—I was interested in reading your note in the "B.J." of March 3 regarding the small use made of the permanganate reducer. I have for years employed it in lantern slide work (also for negatives), and for reducing an over-dense slide consider it unequalled. If sufficient exposure is given and development carried out for contrast (neglecting density), very few plates need be wasted. The commonly accepted opinion seems to be that the silver is oxidised and dissolved by the reducer, and is then washed out of the film, but this, I think, is an error, as the following experiment will show:—If a plate is cut in half, one half reduced and the other half untreated, and then both are sulphide toned, the two halves will be found to be similar in density, showing that the silver is not removed from the film, but converted into a colourless transparent form, which resists the action of an ordinary developer as used in the Autochrome process. An after-bath of hypo does dissolve and remove the silver. There is room for investigation here. Is the silver first oxidised and then converted into sulphate which is only sparingly soluble in water, or does it remain as oxide, or is it converted to manganate; the changed salt being transparent, does it exist in a colloidal form? The compound formed seems to be fairly stable to light after clearing with metabisulphite, but may be slightly yellow in time; after an acid fixing bath there is, as one would expect, no change on exposure to light. These few notes may be of interest to some readers of the "B.J.," and perhaps someone with more time at disposal may care to investigate and express an opinion.—I am, dear Sirs,

Yours very truly,
E. S. Mapleb.

Clyde House, Edgerton, Huddersfield.
March 14.

REDUCTION WITH PERSULPHATE.

To the Editors.

Gentlemen,—I was interested in your editorial note (p. 134) on reduction with persulphate, but I think there is another cause of the irregular action of this reducer, and one which has not received the attention it deserves.

The point is dealt with by Lüppo-Cramer, in his "Kolloid-Chemie und Photographie," and I need make no apology for quoting his views *in extenso*. The translation is my own and makes no claim to elegance. In view of the length of the passage I have omitted the original text:

"I have shown that while thiosulphate itself is not adsorbed by gelatine, the silver bromide-thiosulphate complex compounds, produced during the photographic fixing process, remain in the gelatine as irremovable silver compounds, as soon as the proportion of thiosulphate to silver bromide sinks below a certain level. Also the silver gel. of the negatives obviously takes up silver bromide from the thiosulphate solution, and this becomes more noticeable with increasing concentration of silver bromide in the fixing bath."

"If sensitometer scales, after development in iron oxalate, are fixed in (1) pure 20 per cent. thiosulphate solution, and (2) each in 100 c.c. thiosulphate solution in which 1 to 4 gm. silver bromide have previously been dissolved, there remains by later removal of the silver a residue which becomes considerably greater as the silver bromide content of the fixing-bath increases. This is particularly noticeable when the silver is dissolved away in ammonium persulphate. After fixing in pure thiosulphate the reduction in persulphate takes place quickly and completely, but after fixing in a bath containing much silver bromide, the process of solution of the silver took place extraordinarily sluggishly, so much so that the dissolving of the silver only slowly commenced after half-an-hour."

"Undoubtedly this circumstance plays an important part in the practice of reducing with ammonium persulphate. Should the negatives in question have been fixed in a bath already containing much silver bromide, the reduction with persulphate sometimes does not take place at all. Also the presence of bisulphite in the fixing bath appears to play a part in this connection, since this considerably reduces the solubility of silver bromide in thiosulphate."

"Since, however, an after-treatment with pure thiosulphate of such a silver gel. charged with silver bromide partly removes the adsorbed silver bromide, it is desirable in photographic practice for a negative, which, owing to its gradation, is to be reduced with persulphate, to be once more re-fixed in pure thiosulphate before the reduction is undertaken."

I may say that I have always followed the instruction in the last sentence, and it is possibly owing to this precaution that I have not been troubled with the irregular action referred to in your editorial.—Yours faithfully,
W. B. Shaw.
29, Wednesbury Road, Walsall.

DR. RODMAN.

To the Editors.

Gentlemen,—On behalf of over 5,000 members of photographic societies represented by the "Club Photographer," I should like to be permitted to associate myself with the tribute you have paid to Dr. G. H. Rodman. He has shown himself a real friend not only to the R.P.S. but to the other photographic societies in the kingdom.

During my term of office as secretary of the Liverpool A.P.A., Dr. Rodman took the trouble to come down to give us his latest lecture, despite the pressure of his duties as president of the R.P.S. When, later, I invited him to assume the duties of judge of the scientific section of the "Northern" and also to give us another lecture, he assented willingly and made no trouble of the fact that this visit would entail a stay of some days in the Merseyside city. So highly is Dr. Rodman esteemed in Liverpool that the very rare distinction of honorary membership of the L.A.P.A. was conferred upon him.

Yet Dr. Rodman, while taking all pains to please us in Liverpool, by no means forgot his allegiance to the R.P.S., as he did some very active recruiting, and took back with him to London no less than five nominations on his first visit alone. I remember this distinctly, as I was his first victim.

He has, further, shown a keen interest in the progress of the club movement, and, as his Christmas message to all club photographers showed, his interest was not merely a surface expression but a very active association with all matters appertaining to photographic clubland.

He has carried out his exacting duties most efficiently, yet has left none but pleasant memories with those with whom he had associations, and I am only voicing the opinions of the whole of photographic clubland in wishing him a long life of continued usefulness.
—Yours, etc., Geoffrey E. Peachey,
Editor.

81, Dale Street, Liverpool, March 17.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors

H E.—The makers of the Sanderson camera are Messrs. Houghtons, Ltd., 88-89, High Holborn, London, W.C.1.

M. F.—Your plan appears to be quite satisfactory. Sixteen feet is rather short for full-lengths, but we presume that you could take your camera through the workroom door and get an extra 3 ft. or 4 ft.

R J. A.—Something about your enlarging lantern is much out of the square. It may be that the front and the body carrying the negative holder are not parallel. Get a good set square and test all right angles between the lamp and the lens. Be careful that the negative carrier fits well in its grooves and that the negative is firm in its rebate.

A. H.—We have referred your inquiry to the author of the article on page 112, who informs us that fused calcium chloride is intended to be used in the formula. Crystals of calcium chloride would contain 6 molecules of H_2O, and might be detrimental to the collodion, as well as requiring a greater quantity, just over double, in fact.

P F.—If you have facilities for recharging them you can do very well with accumulators. For enlarging you would require, as a minimum, an 8 volt 1,000 ampere set. This with a 20-watt gas-filled motor headlight bulb would give you 40 c.p. for a good many hours. These lamps have a closely coiled filament, which should not be apparent on the screen.

B. H.—There are several systems of puttyless glazing. Messrs. Braby, 352-364, Euston Road, London, N.W.1, have one called the "Drop-Dry." This can be had with steel or wooden sash-bars. Another good system is that of the British Luxfer Prism Syndicate, 16, Hill Street, Finsbury, London, E.C.2. Either of these systems will be absolutely drip free, provided that suction is not permitted at the overlap of the panes.

C C. S.—We are afraid it is not possible to say why the hypo-alum bath in the lead-lined dish is so much less active than when the solution is used in an enamel dish. It is quite possible that the lead exercises a restraining action on the bath owing to combination with the sulphide, which is the active constituent of hypo-alum. We think that an enamel or earthenware dish should be invariably used for hypo-alum, and that is the general practice.

W. N.—Certainly you are at liberty to use the photographs for other purposes, it being presumed that you are granting reproduction in the journal for which you are writing only for the specific purpose of illustrating your article. If, however, you wish to dispose of the copyright outright, you must, as you say, cover yourself and your editor by excluding the right to reproduce the prints in connection with your article.

B H.—The celluloid discs of which you enclose samples are, in our opinion, absolutely useless as supports for any kind of photographs. To coat them singly with emulsion, even if they were clear, would be very difficult, and would cost more than ready-coated film could be purchased for. The only use that we can suggest is to make varnish or lacquer from them. There is a considerable demand for a clear celluloid lacquer for bright metal goods.

B. W.—Under the circumstances named we prefer the cascade pattern of washer, although, of course, it calls for more hand manipulation than the rotating drum or similar appliances. If the tanks are well made of a hard wood it is not necessary to give them any coating. There would be no objection to giving a coating of shellac varnish or good white enamel, but these coatings do not last for a very long time, and if the tanks are well made they are better without them. Messrs. Brodrick, Ltd., 50, High Street, Bloomsbury, London, W.C.2, make a very good cascade washer entirely of wood.

B. B. L.—Legally the copyright in the photograph which has been sent to you for enlargement is the property of your customer. Therefore, he is quite within his rights in ordering the enlargement and you are within your rights in doing the work to his order. We think that is as much as can be said. We do not think you are entitled to put your name below the coloured enlargement of a photograph by another photographer, even though the colouring is yours. By so doing the maker of the original portrait would, we think, have certain ground for action against you. Of course, unless you have the consent of your customer, you have no right whatever to exhibit any version of the portrait in your showcases without his permission.

G H. J.—(1) About the best general text-book on half-tone block-making is "Photo-Mechanical Processes," by W. T. Wilkinson, published by Messrs. Hamptons, Ltd., 12, Cursitor Street, London, E.C.4, price 4s., but no text-book is at all an efficient substitute for practical instruction in block-making. (2) We think your difficulty in getting half-tone blocks to come out well on news-print is that the block is made with too fine a screen. For blocks which are printed on paper, such as that used for the "B. J.," the half-tone screen should not be coarser than about 100 lines per inch. Of course a great deal depends upon the printer, and also upon the maker of the block. (3) The little French manual on air-brush work is not published in English.

E. M.—Whatever pattern of lamps you use you must have a diffusing screen, otherwise your negatives will be unevenly illuminated. If you use clear glass bulbs the form of the filament will be visible on the enlargement; with opal or ground glass globes you will have blobs. You will require two sheets of ground glass with a space of about 4 inches between them to get anything like even lighting. Four clear lamps with such a screen should answer fairly well. This method of lighting is very wasteful of current as compared with using a condenser. An inverted pyramidal reflector lined with silvered glass, with one lamp in the centre, would be more economical, but you must take care that the angle of the reflectors is such that the full power of the light reaches the ground glass.

W. V. L.—It is difficult to fix a price for the work you mention, but for your guidance we may refer you to the current "B.J. Almanac," on page 310 of which you will find a scale of prices for commercial work. In this 7s. 6d. is given for half-plate negative and one print. This, we think, is much too high for an order of 1,000 different subjects. A London trade firm advertises the low price of 1s. 7d. for making a quarter-plate negative and 11d. for a half-plate enlargement, making 2s. 6d. per subject, exclusive of collection and delivery. You must decide between these limits what price you think your customer will be willing to pay. If you are a member of the P.P.A. you would do well to communicate with the Secretary. We believe that the Society has discussed the matter, but, so far, has published no scale.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. PRICE FOURPENCE.

TERMS OF SUBSCRIPTION POST FREE.

UNITED KINGDOM OR CANADA.—*One Year*, £1 1s. 8d.; *Six Months*, 10s. 10d.; *Three Months*, 5s. 5d.

ANY OTHER PART OF THE WORLD.	*One Year*	£1 3s. 10d.
	Six Months ...	12s. 0d.
	Three Months	6s. 0d.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibits the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3230. Vol. LXIX. FRIDAY, MARCH 31, 1922. Price Fourpence.

Contents.

SUMMARY.

By courtesy of Mr. T. C. Turner, we are able to publish the text of the short address given by him at the recent annual general meeting of the Professional Photographers' Association on electric light in portraiture. Mr. Turner describes the system he uses of confining the light within a given space by adjustable reflectors and also a form of portable half-watt lamp found of great utility for many pieces of work away from the studio. (P. 183.)

Professional photographers will be able to obtain season tickets for admission throughout the whole week of the Photographic Fair (May 1-6 next) at the nominal price of 1s. (P. 194.)

It is announced that Mr. Lang Sims has resigned the secretaryship of the Professional Photographers' Association, the Council of which have appointed Mr. Alfred Ellis in his place. (Pp. 193 and 181.)

The Professional Photographers' Association has finally authorised arrangements for the publication of a monthly "Record" (P. 193.)

In a recent address to the London Camera Club Mr. F. C. Tilney vigorously attacked present-day motives among pictorial photographers, and directed severe criticism upon the practice, prevalent among painters as much as among photographers, of imitating styles and mannerisms and neglecting natural beauty for the sake of many descriptions of "stunts." (P. 186.)

In the concluding portion of his paper on photographic tests of developers, Mr. J. I. Crabtree, of the Eastman Research Laboratory, gives examples of reports upon developers to be employed for various purposes. (P. 188.)

Defects which are often ascribed to a lens arise, in fact, from mal-adjustment of a camera. In a leading article we refer to the chief points which call for examination in this respect. (P. 182.)

It is announced that the paper making firms of Wiggins, Teape and Co. and Alex. Pirie and Sons have come to an agreement for a fusion of their interests. (P. 194.)

At the Royal Photographic Society on Tuesday evening last sincere regrets were expressed at the departure of Mr. F. F. Renwick. Mr. Ryde, of the General Electric Co., and Mr. Storr, of Ilford, Ltd., dealt with the properties and use of the new Osglim electric lamps. (P. 192.)

The great convenience of a light-tight cupboard running below the dark-room bench is the subject of a paragraph on page 181.

We cannot recommend the revival of methods of platinum toning of gelatine prints, since years ago, when this process was tried, the sepia results were found not to be of a satisfactory degree of permanence. (P. 182.)

Under the present Copyright Act, as under the previous one, "colourable imitation" is the touchstone of infringement. We refer to a test case which was notable at the time, and still supplies guidance in such cases. (P. 182.)

For removal of shellac varnish from negatives, methylated spirit with addition of a little ammonia is about the best means. (P. 182.)

Ex Cathedrâ.

New P.P.A. Secretary. As announced on another page, Mr. Lang Sims has resigned the secretaryship of the Professional Photographers' Association, the Council of which body has appointed Mr. Alfred Ellis in his place. We think the choice is an excellent one. Mr. Ellis has been a member of the Association from its very first inception, and was, in fact, its secretary during the first three years of its existence. For some considerable number of years past he has held the office of chairman of the Council, in which capacity all the affairs of the Association have come under his personal notice. Throughout the whole twenty-one years' existence of the Association no one member has been more assiduous in its support or has become so fully acquainted with the movements which from time to time have taken place within its membership. And further, the appointment has the good feature that Mr. Ellis is now able in his retirement to devote the whole of his time to the business of the Association, and is establishing, at his home, 2, Vinery Villas, near to the St. John's Wood station on the Metropolitan Railway, an office, where members can personally consult him in any matters of difficulty. For those duties, his life-long experience, technical and commercial, as a professional photographer makes him fully acquainted with the conditions and difficulties of his brethren, and, moreover, he carries in his mind the memory of schemes which in the past have been suggested but have been found impracticable. A suave man of affairs, whole-heartedly interested in the welfare of photographers, Mr. Ellis deserves, and we are sure will obtain, the support of the whole membership of the Association.

* * *

The Dark-Room Bench. If we were asked to name the fitting which is likely to be most appreciated by anyone doing a variety of work in a dark-room, we think we should give our choice to that construction of the working bench which provides a roomy light-tight cupboard running immediately below the bench surface. Its height need not be great—say, 6 or 8 inches—and its door or doors should be hinged along the lower edge, and secured, when in the shut position, by the convenient ball catch. This form of fastening allows of the door being instantaneously opened or closed by a pull or push. As a receptacle for sensitive negative or lantern plates in course of loading into holders or printers, a cupboard of this kind is a great convenience, the plates being most accessible, yet fully shielded from chance of fog. Also, a division of the cupboard may well be set aside for the reception of developing dishes in which, for example, under-exposures are being allowed ample time in a weak solution; or, indeed, for any plate in course of development, if there is the occasion to open the dark-room door. It goes without saying that the working bench itself must not admit the least drippings of solutions to

the cupboard; the otherwise excellent covering of cork lino is a sufficient safeguard in this respect. We have had such satisfactory experience of a dark-room bench embodying this cupboard that we are sure no one will find fault with us if they act on this recommendation in fitting or re-fitting a dark-room.

* * *

Platinum Toning of Bromides. Those who of late in this country and abroad have been advocating the after-toning of bromide prints with a platinum bath must certainly be ignorant of the efforts made some fifteen years ago to popularise this method. The papers and demonstrations of Mr. Winthrope Somerville, who, we believe, was the originator of the process and almost its sole protagonist, did all that could be done to persuade photographers to entrust their bromides to the tender mercies of platinum toning for the sake of the admittedly handsome sepia tone. Experience showed, however, that the process has certain serious defects. For one thing it has its likes and dislikes as regards the type of paper the prints on which it will tone. The gaslight prints of that day—it may be different now—were not readily susceptible to it. But its most grave disadvantage is the fugitive character of the toned prints. It appears inherent in the use of a soluble salt of platinum, with or without mercury, for the toning of a gelatine print that the permanence of the sepia-toned deposit is poor; that is, of a much lower order of permanence than the untoned image. And, to name a third drawback, the process was expensive enough when platinum was about £4 an ounce. At the present price of the metal there can be little inducement to use even a perfect process for such a purpose.

* * *

What is Infringement of Copyright? The use in the definition of copyright (in the Copyright Act) of the comprehensive phrase "in any material form whatsoever," makes it clear that the copying of a photograph in any process constitutes infringement. A wash or line drawing, an engraving and a three-colour reproduction from a photograph are equally infringements. In the Act of 1862 it was described as infringement "colourably to imitate" a work. This term is likewise used in the 1911 Act in defining an infringing copy. (See Section 35 of the Act.) Its use is of importance, since it provides against an infringer making such slight alterations as to protect himself against the charge of exact copying. For example, it prevents an artist making a drawing in his own individual style from a photograph; if the whole drawing or certain parts peculiar to the photograph, identify the photograph as the original from which the artist worked, the photographer has a claim for infringement. A judgment on this point was given in the case of Bolton *v.* Aldin. Mr. Cecil Aldin, the artist, had copied a photograph of a tiger by Mr. Gambier Bolton, the well-known animal photographer. The drawing was held to be a "pure copy and a very good copy" of the photograph, and as additional proof thereof it was shown that the tiger in the photograph had a cancerous growth in the mouth, which had been copied by the artist as part of the mouth itself.

* * *

Removing Varnish. Before attempting to remove varnish or retouching medium from a negative it is desirable to ascertain the nature of the solvent used for the gums, or considerable difficulty may be experienced. Fortunately, most negative varnishes consist of shellac and sandarac dissolved in alcohol, so that the coating may be removed very easily by the application of methylated spirit. The action of this is rendered much more effective by the addition of about five per cent. of .880 ammonia, which is in itself a solvent of shellac, and seems to leave the surface in a much better condition for intensification or reduction than plain spirit does. While in the spirit the surface of the negative should be well rubbed with cotton wool and wiped dry after taking out. A second bath of spirit, with or without ammonia, should then be given to remove the last traces of gum, and then the film should be soaked till all greasiness disappears. Retouching medium can be cleaned off with pure spirit of turpentine, rubbed on with cotton wool, using clean turpentine and wool until the surface appears quite even. Celluloid varnish may be removed with amyl acetate, alcohol or acetone. As the fumes of the first-named are injurious to some constitutions it should be avoided, if possible. In all cases where plain spirit is used it should be of full strength and not have been used for drying negatives.

THE LENS OR THE CAMERA?

We have recently had to deal with several queries concerning the alleged unsatisfactory performance of various lenses, and in each case it has been found that a want of accuracy on the camera or enlarger has been the cause. It may be assumed that, except through accidental damage such as may be caused by a fall or other violence, any lens bearing a name of repute is capable of covering the plate for which it is listed with sharp definition to the edges. If this is not found to be the case, a rigid examination of the camera should be made in order to find out whether the axis of the lens is at right angles to the plate or, in other words, whether the front and back of the camera are parallel with each other. A very slight error in this respect will seriously impair the performance of a rapid lens.

The method of examination must of necessity be varied to suit the different types of camera. With most stand cameras a good 90 deg. set square and a flat boxwood or steel rule are all the instruments necessary. The former is used to test the rectangularity of the front and back in relation to the baseboard in the vertical direction and the latter for checking the parallelism of front and back in the horizontal plane. The principal sources of error in the former position will usually be found in bent or strained struts, or in slots or notches, which either through faulty design or wear allow the moving parts to be clamped in an incorrect position. In the latter position the error is often due to wear in the rackwork allowing a tooth to be missed, and, perhaps, again picked up when closing the camera. Parallel cameras, in which the back is drawn out and clamped upon metal guides, should be very clearly marked on both sides at equal distances from the front, and great care taken in adjusting the back to these marks. It should be seen that the swing back of such cameras fits closely and accurately to the camera body when closed.

Hand cameras of the collapsible type are more difficult to test, as there is not a firm baseboard as a datum. The best plan is to use a good spirit level, say, six inches long, in the following way. Level a flat piece of glass upon three screw eyes fixed in a board or table top, taking care that the eyes are near enough together to come within the dimensions of the focussing screen of the camera. Remove the glass plate and put the focussing screen (which is, of course, in its groove) in its place, then lay the spirit level across the front cell of the lens. If the bubble remains central on being turned in all

directions the lens is truly normal to the surface of the screen. Errors will usually be due to strained struts or loose or broken pivots.

Reflex cameras, owing to their solid box-form construction, are only liable to get out of adjustment by way of the mirror. The best way to detect this is to set up a test object—a brick wall will do—which will cover the whole screen; then, after removing the hood, carefully examine the images successively, upon the top and back focussing screens. Any difference will at once be apparent.

Failing the discovery of any want of truth in the camera, the dark slides must be carefully examined. It is not enough to test them in the centre of the plate, as it is possible that this might be correctly situated, while one end was too near the lens and the other too far from it. Each corner must therefore be carefully tested with a simple depth gauge made with a screw passing through a stout lath. Every slide should be tested, for it has, at any rate, been our experience that extra slides fitted subsequently to purchase of a camera are not always accurate.

So far, we have sought for errors in the camera, but there are other quarters in which they may be found. A want of covering power which limits the use of the rising front is often due to too small an aperture in a before- or behind-lens roller-blind shutter. This can be proved by removing the shutter and attaching the lens to a temporary front for examination.

Lenses fitted in aluminium between-lens shutters should receive careful treatment, as pressure upon the lens cells may distort the shutter case and seriously impair the definition. This may be caused by closing a folding camera of the Kodak type without pushing the front quite home, or with a separately carried lens by forcing into too small a case. If at any time it is desired to fit a lens into another shutter, it is wise to let this be done by the maker of the lens, who will apply his usual tests before returning it.

What has been said of cameras applies equally to enlarging lanterns, the chief fault of which is the bad fitting of the negative carrier in its groove. This often allows enough play to cause considerable unevenness of definition, while weakness of the springs, which should bring the negative level, contributes to the same end.

ELECTRIC LIGHT IN PORTRAITURE.

[Following the annual general meeting of the Professional Photographers' Association, which was recently held, Mr. T. C. Turner, of Hull, gave a short lecture and demonstration of electric light in photographic portraiture. Through the kindness of Mr. Turner we are able to publish the text of this short paper. The occasion was one on which it was not possible for Mr. Turner to put before his audience a tithe of his wide knowledge of artificial light in the studio, gathered in the course of many years' practice with almost every system which has come into use, but nevertheless the very practical hints which he had to give, particularly on the usefulness of a portable half-watt installation, will certainly be of value to those having the occasion to undertake portraiture away from the studio after dark. The portrait of Sir Landon Ronald and also the profile study of a lady were taken with the portable outfit which is described and illustrated in Mr. Turner's paper.]

The last occasion upon which I had the privilege of addressing you upon the subject of artificial lighting in photography was at the second Congress held at the Horticultural Hall on May 16, 1911, a report of which the "British Journal of Photography" was good enough to give *in extenso* a few days afterwards.

The methods we had in use up to that period (eleven years ago) were, the open carbon arc (improved from Van der Weyde's time by running four pairs in series), the enclosed arc, the ordinary carbon filament lamp brought to high incandescence for a brief period by cutting out a resistance in the circuit, known as Adamson's lamp, and, lastly, the "Cooper Hewitt" Mercury vapour lamp, with various modifications, such as the "Silica" lamp of the Westinghouse Co. Now some of these systems are still very much in use, but in the exceedingly limited time available this evening I do not propose to touch on their special advantages for certain definite purposes—as they are pretty generally recognised.

The Half-Watt or Gas Filled Lamp.

In the year after that second Congress of ours, an event of far-reaching importance to photographers occurred with the introduction of what is known as the ½-watt lamp, which, in 1913, was already installed in a few studios. As many of you may know, these lamps are filled with an inert gas, those of large wattage with nitrogen, and the smaller sizes with argon. During the war the British makers were not allowed to fix up the elaborate plant necessary for the manufacture of this gas, and many of us were forced to obtain lamps of high actinism "made in Holland." Happily, now, the British product is unequalled.

The advantages which came with the half-watt lamp were these:—

The grime and dust of the consumed carbons could be avoided; also the need for constantly renewing them. Risks of fire were lessened and once properly installed the lamps were safer for the non-technical operator to manipulate, and the sitter felt more at home under the warmer light than under the colder effulgence of the arc. But the greatest of

Fig. 1. Photograph of Mr. T. C. Turner's studio, showing adjustable reflectors mounted on rollers placed on each side of the half-watt installation and movable transversely.

the benefits we gained with the introduction of this lamp is the better rendering of tone values, and the much increased power of control in lighting our sitters.

As in the making of an artistic picture, the chief thing is what we are able to leave out, so in this matter of lighting

the advantages lie all on the side of that illuminant which can be most readily kept from flooding the room with undesired detail and yielding the greatest variety of effects. You may say that the actinism of the *arc* is so much greater, and that for a given number of watts the effect is far more

Fig. 2.—Showing reflectors in the rolled up position.

powerful than with the same current going through half-watt lamps.

That is largely a question of the manner in which the two systems are employed. The arc requires much more diffusion, needs to be used at a greater distance from the sitter, and is less amenable to shading control than the gas-filled lamp. I have brought here to-night a small portable outfit, which anyone with a little assistance from tinsmith and ironworker can put together at quite small cost. You will find it contains many essentials of the permanent studio installation, but in miniature.

The supporting pole has a sliding rod—one of the old curtain poles with a fairly heavy circular plate and ball castors makes an excellent stand. The rod is pierced for pegs, and has a 5-ft. projecting arm easily placed in position for carrying shaded lamps, which control the lighting of the sitter's hair and shoulders. On the upright

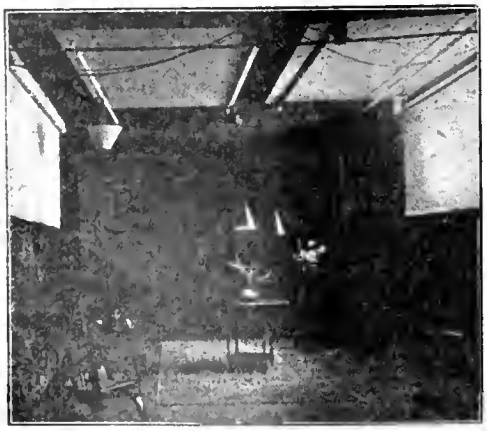


Fig. 3.—Photograph of the studio for open lighting. The view shows the Meccano carriages for 1,500-watt lamps running on the T-irons. Small hooded lamps can be brought down from the ceiling, and likewise run on a Meccano carriage which travels on a stretched wire. This electric fitting is found very useful for lighting hair.

pole are grips and rods which carry slightly larger shades (about 12 × 10 in.).

The handle is made hollow so that the lamp and shade easily come off the rod, and the exposure made with lamp in hand instead of on the pole. The background may be lighted with one of the spare lamps, the whole object being to obtain control of the direction the light is to fall and to work pretty close to the model.

The shades are painted inside with white flat Japan, the lamps themselves acid-obscured at the front, or diffusion

Fig. 4.—Photograph showing system of main lighting with three 1,500-watt lamps. The white background is shown as used for sketch portraits, being lighted by a G.E.C. flood light lamp shown at A.

secured by fitting on a sort of biscuit-tin lid stretched with China silk or translucent paper held in position with a spring in the lid. Matt varnish for "frosting" should not be used, as it quickly turns yellow.

Lamps should be fitted into the screw-in type of holder, and not the bayonet form, as great heat is generated by the "half-watt" lamp and the spring contacts rapidly weaken.

Fig. 5.—Portrait of Sir Landon Ronald taken by Mr. T. C. Turner with the portable lamp described in his paper, in conjunction with a certain amount of general diffused lighting.

Mr. Turner then demonstrated the manner of working with 200-watt lamps in the shades, and said one of the advantages of such a "pocket edition" of a lighting apparatus was that it could be worked off the ordinary house wiring and from a 5-ampère switch, if the switch was a sound one of good pattern—many, of course, being badly made and liable to arc.

In referring to the permanent appointments of a studio

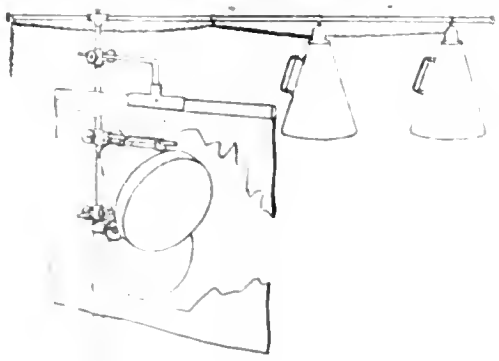
required for large groupings and single-figure studies, Mr. Turner said he believed in methods of quickly enlarging and reducing not only his *lighting* area, but his *reflecting* area; in other words, he made a large studio or a small one by carrying in or out reflecting walls of whitened canvas hung on rollers from "T" iron supports. Many photographs were exhibited to illustrate this studio method, and the types of lighting obtainable. No small interest was shown in the use of "Meccano" carriages to support the lamps running on the "T" irons, and from iron wire stretched from the top of the studio. It is a novel and effective device worked out by Mr. Eric Turner.

Mr. Turner particularly explained that these reflectors were the usual white grounds. When employed in a lowered position he was careful not to let them come below the level of the top of the head, otherwise an unpleasant appearance was produced in the eyes of the sitter. Also, when a lamp was burning on the right side, the corresponding lamp on the left side requires to be switched off, otherwise there is lack of modelling. Further, great care has to be taken that no light from either the ceiling or the sides shall fall towards

Fig. 6.—Portrait of a lady taken with the portable apparatus. This photograph illustrates the use of the shades and the manner in which the background is kept a natural dark shadow

the lens. This is easily prevented by angling the reflectors somewhat, that is to say, inclining them towards each other so that they form the sides of a triangle the point of which is in the neighbourhood of the camera. A screen may also be used with advantage, narrowing the opening towards the "box of light."

One of the advantages of this false ceiling is that with the coming of "summer time" one section easily slips partly



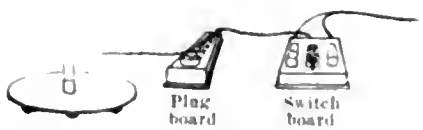


Fig. 7. Diagrammatic sketch showing the portable half watt lamp described by Mr Turner

back over the other, leaving plenty of daylight through the ordinary skylight. Under this arrangement daylight negatives may be readily made as and when the light permits, and the lamps employed for Rembrandt or other fancy lightings. Mr. Turner's experience has been that the arrangement allows of a great amount of control in a large studio, such as his is, and as are many of those built years ago when the chief aim was to get a flood of light.

The General Electric Co., of Kingsway, kindly lent the half-watt lamps used for the demonstration, and Mr. Turner said this great firm was always interested and helpful in the development of apparatus as applied to photographic purposes. At the moment he was experimenting with one of their new 500-watt "flood lights," which promised to be a useful accessory for special work.

Messrs. Marcus Adams, Corbett, Speaight, and Banfield contributed a most interesting discussion which followed the demonstration, and the president, in proposing a vote of thanks to Mr. Turner, said he was impressed by the great instructional value which had resulted from the remarks of all the speakers of the evening, treating the subject, as they did, from so many points of view.

PHOTOGRAPHERS AND THE G.P.O. A curious case of G.P.O. idiosyncrasy, and one of particular interest to photographers, is reported in the daily newspapers. An establishment has for many years been sending out circulars and proofs in envelopes or wrappers with the name and address typed across the width and not the length of them, the typist doing them width-ways because of the typewriter not taking the envelopes and wrappers length ways. Last week, however, a batch of circulars and proofs were held up by the authorities because of the matter being, it was said, incorrectly addressed. Investigation proved, however, that nowhere in the official instructions could the sender find any reference to the manner of address nor shape of the envelope, and after being held up for three or four days the matter was allowed to go through the post as usual. A correspondent informs us that this idea concerning cross-addressing is common in many suburban post offices, many of the young counter hands having but the most vague ideas as to what is in and what is not in the official handbook. Economy is now the order of the day, continues our correspondent, particularly as regards postal, telephone, and telegraphic business, and it is surprising that more business houses do not have code addresses, and so save money. The latest returns show that about 133,000 firms in the United Kingdom are using code addresses, but photographic firms are not so keen about them as they might be. In London alone there are 33,400 persons who have paid the £2 fee for the use of code names, and Sell's directory of code words of the Kingdom just issued shows the ingenious ways in which the trade have made this firm's name or business into a suitable code. Beside the usual code words for telegrams the "round number" for telephones is also much in demand. Blocks of round numbers are kept specially for busy lines. People wait for months to get hold of a good one, and some firms declare that they owe a good deal of business to the round number call. Houghtons, Ltd. (Holborn 2500) is a good example of a round easily remembered number, and special efforts were made some years ago to get it.

THE NEED IN PICTORIAL PHOTOGRAPHY.

[The following address recently delivered by Mr. F. C. Tilney at a meeting of the London Camera Club reaches us without a title. We have given it that which appears above, thinking it one to which Mr. Tilney would scarcely demur. That the author was in a castigative mood when he committed his words to paper is sufficiently evident; yet when allowance has been made for a special vigour of expression, it is still seen that the themes of the papor are those which have always dominated Mr. Tilney's teaching, viz., the plea for the study of the artist's temperament and a relentless hostility to the modern exaltation of all descriptions of mannerism. Photography in particular can benefit by such healthy wind of criticism as this.—EDS. "B.J."]

ALTHOUGH this is a camera club I feel that its activities are so multitarious, and the tastes of its members so catholic, that something in the nature of an apology is due from me for proposing to talk about my old, one and only—*art*. If nothing but photography were thought of within these walls my subject might still be considered somewhat an alien one by those who maintain that art is one thing and photography another. But I believe that there is a still further dilution of art in this club. It is whispered to me that the click of the billiard ball is a more frequent sound than the oaths of the developer in the dark-room. But perhaps that only shows the restraint and good behaviour of the latter.

At any rate, here I am, with that tedious old subject before you again. How perennial it is—how immortal! There is no word more constantly on the lip, and no subject less understood.

When the photographer *is* an artist there is nothing to choose between him and a painter. They both look out on Nature in the same way. They feel and they know. And they know when others cannot feel, but only pretend to. The true artist can only see and feel in one way, and that is his own way. Be he painter or photographer he can only feel through his own consciousness; and the man that has to adopt the ritual of others as an outward credential when he has nothing within himself is he that cannot and never will make the true artistic demonstration.

Modern painting is, as we know, teeming with humbug that is all trick and observance without anything of the divine efflatus behind and within it. The teeming humbugs find it easy to pass for the real thing among those who do not know. The facility is due to modern journalism, which thrives only on stunts. Stunts make sensation. The humdrum of real art does not. Therefore the critics (pardon the misnomer)—I mean the penny-a-liners—boost the stunters and everybody is happy except the artists.

The photographer when he is not an artist—and mostly he isn't—adopts the outward observances of the painters, both the stunters and the good sort, too. For not having the real Freemasonry of Art he finds it difficult to discriminate between the real and the sham. He finds, too, in his turn that if he adopts the style of the Futurist or the Cubist he stands a chance of getting some recognition from the penny-a-liners.

Time was when this tendency was pretty bad. But, thank God, the days of Coburn at his worst, *et hoc genus omnes*, are over. The stuntists in photography have found that they cannot make it pay, and I, for one, have done my little best to queer their pitch.

But there is still a vast amount of humbug going forward; although it is not of the shameless sort that puts on motley and stands on its head in the market-place. Quite a lot of the humbug is harmless and excusable—the result of a sort of auto-suggestion more than anything else. A man larks about with his boy's toy camera and gets bitten. "Hm!" he says. "I think I'll get one myself." He buys a good one, joins a local club, exhibits in the Beginners' Section, gets promoted in time, wins certificates, and eke a medal, and the hat thereof knoweth him no more. It is a pretty little epic, but it represents truly the course of art training of the average photographic "artist." The reason he gets swelled head is that he mistakes his medal and other awards for proofs of genius. He does not realise that what he does anybody could do with a little practice and a little teaching of the tricks of composition picked up in the two-penny journals. He refuses to see that hundreds of thousands *are* doing it.

I do not say that there are not grades of excellence in this accomplishment, nor that the best results of those who have rolled in the art-pollen are not beautiful things. But I do say that the impulse does not come from within once in a thousand times—it comes from without—is adventitious. It is indeed the observance—docilely, admirably learnt and unimpeachably practised—of others' practice.

But I have no quarrel with such photographers, because, as I have admitted, the best of them produce admirable things. Whether the whole of the credit is due to the photographer or to happy fluke and the perfection of apparatus is another question. With fool-proof cameras and developing tanks, and with experts to do the enlarging, it is only possible to make bad prints by absolutely bad selection of subject and subsequent personal control in the printing. And, if you think of it, it is on these points that most of the bad work rests.

My quarrel is with those who having all the present-day advantages are yet unable to catch a breath of that proper and personal art feeling that would, under such advantageous conditions as photographic execution enjoys, bring off a masterpiece every time. Why should they ever fail?

The truth is they are content with the lotter of Art and seek not the spirit. They think they know because they talk glibly the art jargon. They think, too, that their method of teaching one another is all that is needed. They see nothing anomalous in the fact that the blind should lead the blind.

If they would but learn, or learn to teach themselves, instead of attempting to thrive on the mutual criticisms of the postal album and the local exhibition, they might some day be really converted, in which case the observances they now practise would have something of meaning for them.

For I believe that Art can overwhelm a man, just as the rabid Salvationist believes that Divine grace can suddenly overwhelm a man—perhaps not quite so quickly as in the latter operation. We can't make artists by sudden conversion at revivalist meetings; but we *can* make them, if they will give themselves to the business. Art is only a way of looking at things—nothing more. The Beauty sense is in us all; it is a germ in various stages of development, and sometimes not developed at all.

I quarrel with the photographer who looks at pictures and copies mannerisms from them; content to think that by so doing he is making artistic pictures. For my point is, that he copies these styles and mannerisms, not because anything in them gives him a thrill of joy; but because he believes he will be mistaken for an artist. Every manner or style that develops into a trick loses caste with the true artist; and if the photographer were converted he would no more think

[illegible] making pictures by [illegible] than he would [illegible] flying. Indeed, he would [illegible] days much [illegible] flying.

One of the most regre[illegible] of [illegible] tendency to teach the [illegible] the painte[illegible] photographers as though th[illegible] gospel of [illegible] mention a flagrant case.

One of the recent stun[illegible] painters [illegible] surface stunt. The argumen[illegible] is thi[illegible] a two-dimensional thin[illegible] well, then [illegible] represent things as three-dimens[illegible]. Was there ever [illegible] folly? We paint things [illegible] height and breadth [illegible] depth; but we must always [illegible] the [illegible] picture surface has only height and breadth! Where is the [illegible] idiot who wants reminding of this? Who looks [illegible] landscape and attempts to [illegible] it?

This is a piece of [illegible] evolved by painters who [illegible] the three-dimensional [illegible] could not make things [illegible] round if they tried, and [illegible] skill to represent [illegible] between vertical [illegible] unfortunates have [illegible] virtue of necessity by adopting [illegible] method of [illegible] the kind that employs [illegible] no [illegible] cast shadows. The [illegible] method was [illegible] only to the practice [illegible] great Art [illegible] of the ages was a fact [illegible] could [illegible] upon, so the critics [illegible] the period [illegible] called this confession of weakness [illegible] a heaven-sent [illegible]. All are from antiquity [illegible] with all the [illegible] great names—Pheidias, [illegible] Angelo, R[illegible], Rembrandt, Rubens, Claude, [illegible]arth, Reynolds [illegible] these were wrong, poor [illegible] who had [illegible] and bashed their heads against a three-dim[illegible] fallacy. It was left to twentieth century ingenuousness [illegible] upon the true idea—flatness.

In their ignorance these [illegible] of this idea [illegible] Velasquez and Whistler [illegible] the sublime [illegible] flatness—Velasquez, the man [illegible] all others who [illegible] ambient enveloping a figure [illegible] Admiral—the [illegible] example of the advocates—surpassed [illegible] Philip IV. [illegible] picture momentarily for the [illegible] himself. These [illegible] not see that the flat [illegible] black costume [illegible] are the true impression of a figure standing in [illegible]. They cannot see that Whistler, an arch-[illegible], for all his genius, painted in the same flat Velasquez manner without arriving at anything like the [illegible] exemplar; that Whistler's flatness was [illegible] borrowed from Velasquez [illegible] mixed up [illegible] the decorative formulas of Japanese art. What [illegible] these two painters [illegible] for the theory [illegible] pictures should be painted in such a way as not to [illegible] spectator to forget that [illegible] sheet of [illegible] thing of two dimensions.

This trick is being taught to photographers. [illegible] one quality in which the photographic picture [illegible] three-dimensional [illegible] going [illegible] relief, we can find in [illegible] executed photographs convincing evidence [illegible] near and [illegible] it represents. [illegible] have [illegible] certain teachers [illegible] eliminate [illegible] strength of photographic [illegible] and [illegible] prints that [illegible] suppose Velasquez [illegible] and which they believe [illegible] characteristic [illegible] brilliant genius of Whistler. [illegible] knows [illegible] and relief have been [illegible] of decorative [illegible] Renaissance [illegible] excelled in it. The eighteenth [illegible] ornament [illegible] in engraving [illegible] popularly [illegible] in masterly strength [illegible] roundness [illegible]. The old masters [illegible] Impressionists [illegible] Water-Colourists [illegible] great school [illegible]

[illegible] that true dimensional [illegible] normal human vision. [illegible] of painters overstep [illegible] extremity where [illegible] argument for [illegible] on Na[illegible]

[illegible]

the works of others. His works are, once he has learnt the language, works of art.

Why should not the mass of photographers rise to this? Why should they not attain to the true vision and feeling? Could they do so, there would be little risk of their producing mannered work, aggressive designs, shrieking silhouettes, jazz patterns, false tonality, anomalies of light and shade, and "beautiful facts." Above all the supreme sin would be washed away—the effect of thunderous gloom which shrouds the enlargement, the bromoil and the oil print. We should more often see a healthy and naturalistic length of scale, fewer specimens of that mechanical harmony of tone which comes automatically from keeping all tones of nearly the same strength. A ruse of safety for those who cannot manage contrasts. We should see something of the character and power and beauty of form in skies instead of the nondescript light patches that are proffered for clouds in bromoil prints. The best skies occur in the under-exposed views of the beginner. If the bromoiler worked from what he knew and felt instead of what he swanked, he would not ink up his shadows in a wrong order of gradation, so as to mix up his planes. Nor would he be blind to nobility of subject. He would not, for example, find in our splendid streets, with their gorgeous largeness of tone-schemes, their sparkle and quality, nothing to inspire him but the wheels and axles of motor-buses. He would give the iron bridge a rest, with its black and straight girders. He would suppress the eternal pierrot and ballet-dancer. He would, indeed, see that arresting subject-matter is no help to quality, but rather a hindrance to artistic attractiveness; for great art makes sublime the commonplace.

In short, what pictorial photography needs badly is a mental and moral re-birth. What progress there is is that of the dealers, who keep glutting the market with printing-papers bearing a multitude of fancy names which defy the memory. But what difference, artistically, does such progress make? Any old paper will serve the purpose of a man who has something to say and can say it.

I have not treated you to-night to a dissertation upon technical art matters. There is quite enough of that sort of thing done, and it has its abuses as well as its uses. What I have tried to emphasise is the fact—all too seldom touched upon—that art in pictorialism, as in everything else, is expression of emotion; and that if there is no emotion, there is obviously nothing to express. It is then that picture-making has to fall back upon mere sophistications of Form without inspirations of Content.

It is this inspiration alone that can quicken pictorial photography, and put it, as it should deserve, on the level of the graphic arts. The inspiration is impossible without sensitiveness to beauty; and as all beauty is based on principles that are found in Nature, the photographer must cultivate Nature before he cultivates Art. To proceed the other way about, as is now done, is futile. Art is understood automatically when we apprehend beauty in Nature, for Nature teaches the principles of Art and drives us to pictures. Responsiveness and sensitiveness must be developed; and this can be done by systematic training of the eye. At least, that is the common phrase; but, of course, it is not the eye at all; it is the training of the mind to adopt a certain and peculiar attitude towards natural phenomena. But this is quite a different thing from what is understood by an art education; it is, in reality, a general education—directed towards the peculiar psychological culture that is characteristic of the true artist.

You will think that I have been presumptuous and aggressive. I offer neither denial nor defence; for it was my intention to stir you to a discussion. You may turn and rend me; I shall still hold together sufficiently to substantiate the arguments I have advanced. There is only one word I would say to shield myself from your wrath and vituperation: it is that you will give me the credit of recognising that some of the best and most artistic pictorial photographers are members of this Club, and two or three are painters as well as photographers.

My tirade is directed against the rank and file of pictorialists who go on doing wrong things in a fool's paradise from which they are too blind and too self-satisfied to be led away. Many of these enjoy appreciable reputations in the photographic world, and nobody ever attempts to open their eyes.

It is my wish to exalt photography, to cleanse the Augean stables, to imbue it with a pure purpose which shall give it the status amongst the arts that it should long since have enjoyed; and I have taken the only means I know of. My voice for over twenty years has been a voice in the wilderness. I am still preaching in that wilderness, but the willing ears are few.

Perhaps my mission may be thought one of unpardonable arrogance and presumption. I may have no right to assume the rôle of mentor. If this is so I must be forgiven, for nobody yet has hinted this to me; and if I am spoiled, I am spoiled by a too indulgent encouragement from those who perceive my motives.

F. C. TILNEY.

PHOTOGRAPHIC METHODS OF TESTING DEVELOPERS.

[A communication from the Research Laboratory of the Eastman Kodak Company, reprinted from the "American Annual of Photography." The Elon mentioned, it may be stated, is metol (monomethyl paramidophenol sulphate) of Eastman manufacture.]

(*Concluded from page* 172.)

Reports on Developing Formulae.

For practical purposes developing solutions may be divided into five classes as follows:—

1. *Developers for average work.*
   a. Negative developers (tray and tank).
   b. Paper developers.

Tests on these developers should include developing power, life, colour of image, fog, etc.

2. *Developers for under-exposed negatives.*

These developers should be tested against the following formula, which is the best present known formula for under-exposure work:

	Metric.	*Avoirdupois.*
Sodium sulphite	60 gms.	2 ozs.
Elon	16 gms.	250 grs.
Hydroquinone	16 gms.	250 grs.
Caustic soda	10 gms.	150 grs
Potassium bromide	10 gms.	150 grs
Water to	1 litre	32 ozs.

Then add wood or denatured alcohol 50 cc

If this developer gives too much contrast, reduce the negative with ammonium persulphate.

Preliminary tests should be made on flashed film, giving such an exposure that a just visible deposit is given by the above developer in, say, 3 minutes. If the formula to be tested compares favourably with the above, a final test should be given by cutting a camera exposed film in two and developing one-half in each developer.

3. *Contrast Developers.*
   a. Short life type.
   b. Long life type.

The best contrast developer known to date is the following:—

Solution A.	*Metric.*	*Avoirdupois.*
Sodium bisulphite	25 gms.	375 grs.
Hydroquinone	25 gms	375 grs.
Potassium bromide	25 gms.	375 grs.
Water to make	1 litre	32 ozs.

8. See "Elementary Photographic Chemistry," p. 48 (Eastman Kodak Company).

Solution B.

Caustic soda	45 gms.	1½ ozs.
Water to	1 litre	32 ozs.

Use equal volumes of A and B.

This developer will not keep, so that for tank work a comparison should be made with the formula given in the report below, which has much better keeping qualities, but does not give as much contrast as the formula above.

The following example illustrates the method of testing contrast developers :—

Report on a Process Developer Formula for Tank Work.

The formula submitted was compared with the Eastman process Elon-hydroquinone tank developer, the formula for which is as follows :—

	Metric.	*Avoirdupois*
Sodium sulphite	75 gms.	2½ ozs.
Elon	1 gm.	15 grs.
Hydroquinone	9 gm.	135 grs.
Potassium carbonate	25 gms.	375 grs.
Potassium bromide	5 gms.	75 grs.
Water to make	1 litre	32 ozs.

Tests were made on flashed process film, developing for five minutes at 70 deg. F., and the tests repeated at intervals, until on standing in open trays the developers were exhausted. The results were as follows :—

	1st Day.		*2nd Day.*		*5th Day.*	
Developer.	*Density.*	*Fog.*	*Density.*	*Fog.*	*Density.*	*Fog.*
Test formula	1.14	.05	.74	.05	.00	.00
	Developer : Reddish brown.					
Eastman formula	1.62	.09	1.43	.06	1.03	.04
	Developer : slightly yellow.					

The above results show that the developer submitted is inferior as regards developing and keeping power to the Eastman formula.

4. *Ultra Rapid Developer for Recording Paper.*

With many scientific recording instruments the record is made by means of a beam of light reflected from a mirror on to a travelling band of photographic paper. It is often necessary to develop this record almost instantaneously, and for this purpose the following formula is recommended :—

	Metric.	*Avoirdupois.*
A. Sodium sulphite	15 gms.	225 grs.
Elon	10 gms.	150 grs.
Hydroquinone	10 gms.	150 grs.
Sodium sulphite	60 gms.	2 ozs.
Water to	1 litre	32 ozs.

Then add 50 c.c.s of wood or denatured alcohol to keep the Elon and hydroquinone in solution. The sulphite is added in two portions to facilitate solution of the Elon.

B. Caustic soda	25 gms.	375 grs.
Water to	1 litre	32 ozs.

Use equal volumes of A and B.

When comparing a new formula with the above, tests should be made on flashed sheets of paper and preference given to the developer producing the greatest density in the shortest time, providing the keeping properties are satisfactory.

5. *Deep Tank Developers for Motion Picture Film Work and Amateur Finishing.*

Satisfactory developing formulæ in this class are more difficult to work out than any other developing formulæ because deep tank developers must fulfill so many conditions, as follows :—

(*a*) The developer should give a negative of fixed contrast in a given fixed time. An average time for developing motion picture negative and positive film is five minutes, and fifteen minutes for amateur finishing. The time fifteen minutes is convenient because it takes about ten minutes to load a new rack with films. The time of development is easily adjusted by diluting the developer or making it more concentrated.

(*b*) The keeping properties should be satisfactory as regards growth of fog with age, non-staining properties, and exhaustion. After the developer has been used for some time, the concentration of potassium bromide, which is formed as a result of conversion of the silver bromide emulsion to metallic silver, increases, so that if the developer contains much hydroquinone, which is very sensitive to bromide, shadow detail in the negative is lost. Pyro Elon and Ortol are less sensitive to bromide and should therefore predominate in a negative developer. Pyro oxidises rapidly and gives stain unless an excess of sulphite is added, which in turn tends to produce fog. For motion picture positive work the effect of the accumulated potassium bromide is of less importance, since this can be compensated for by increasing the printing exposure.

In tank work, as the developer becomes exhausted as a result of performing useful work, it is customary to increase the time of development by about one minute per day so as to maintain a constant contrast of the negatives.

Tank developers should be given a thorough exhaustion test by developing camera exposed or flashed films in a deep glass tank containing about half a gallon of solution, a sufficient number of films being developed daily so as to correspond to an average daily run in a fifty or one hundred gallon tank. Graded strip tests should also be made daily and developed to a given density contrast, the density of the lowest steps which area measure of the detail giving power being carefully noted.

(c) The alkalinity should not be excessive; otherwise, the acid fixing bath soon becomes neutral as a result of the neutralisation of the acid by the alkali in the developer carried over by the films.

The following example illustrates the method of testing tank developer.

Report on a Deep Tank Developer Formula for Amateur Finishers.

The formula submitted was tested against the standard formula first developing flashed sheets of NC film for 15 minutes at 70 deg. F., the tests being repeated after allowing the developers to stand in open trays over night and diluting to the original volume to compensate for evaporation. The results were as follows :—

	1st Day		*2nd Day*	
	Density	*Fog*	*Density*	*Fog*
Test Formula	1.50	.32	1.40	1.30
Standard Formula	1.60	.20	0.20	0.15

This preliminary test showed that the developer submitted has excellent keeping qualities, so that further exhaustion tests were made by developing the equivalent of five hundred rolls of film per day in fifty gallons of developer for a period of five days. Daily tests were made on graded strips noticing carefully the lowest density and the density contrast. The results were as follows :—

	1st Day				*5th Day*			
	Densities		*Density*		*Densities*		*Density*	
	2nd Step	*6th Step*	*Contrast*	*Fog*	*2nd Step*	*6th Step*	*Contrast*	*Fog*
Test Formula	0.31	1.60	1.29	0.14	.21	1.21	1.10	0.10
Standard Formula	0.30	1.20	0.90	0.13	.20	1.01	0.81	0.13

The above results show that although the test formula has excellent keeping properties, as the developer becomes exhausted it loses its power of rendering shadow detail. The developer costs twice as much as the standard formula, but the cost per unit of work is less, since its active life is greater.

Precautions to be Observed when Testing Developers.

1. Make all tests on film having *the same emulsion number.*

2. The flashed strips or exposed graded strips must all receive *the same exposure*, especially when making keeping tests at daily intervals. To insure this the exposing lamp should be placed in circuit with a volt meter, and the voltage maintained constant at, say, 110 volts. It is also advisable to adjust the time of exposure so that the exposure required is at least 20 seconds either by varying the distance of the printing frame from the light source, or by placing one or two sheets of opal glass between the lamp and the exposing frame. If an error of one second is made in exposing, the error will then be only 5 per cent., while if the exposure given is two seconds and an error made of only one half second the effective error would be 25 per cent.

3. The developers to be compared must be at *the same temperature.*

Tests at daily intervals in order to be strictly comparative should be made at the same temperature, although the temperature usually varies only slightly from day to day. Unless a thermostat is available it is better to make the tests at room temperature (which should be stated), providing the temperature of all the test developers

9. See "Booklet Reproduction Work with Films," p. 10 (Eastman Kodak Company).

is the same, rather than attempt to adjust the temperature to a standard temperature.

4. *The degree of agitation of the developer* relative to the film when making the tray and tank tests *should be constant*, because when the film or developer is agitated the developer in contact with the surface of the film is frequently renewed and the development is much more rapid than when the film and developer are stationary. Handling of the test strips is much facilitated by pinning across a wooden frame with the aid of glass push-pins.

5. When making the exhaustion tests the sheets of film used for exhausting the developer should be half flashed, that is, one-half of the sheet should be unexposed so as to represent an average exposed negative. An average rate of exhaustion is the equivalent of ten sheets of 3 x 10 film per gallon of developer per day for five or ten successive days

As each successive daily test is made there is a loss of developer from evaporation and from absorption by the gelatine film. If the tanks are covered the loss by evaporation will be negligible.

J. I. CRABTREE.

Photo-Mechanical Notes.

System in Half-Tone Operating.

JUDGING from recent communications on the subject, the technique of half-tone negative making is still apparently as much a matter of uncertainty as it was 20 years ago, and, realising the advantages of systematic working, several investigators and inventors have introduced certain apparatus and working methods with the object of standardising workshop procedure, so as to make for a more regular product from the half-tone operator.

We have had the system as worked out by W. J. Smith and E. L. Turner, and crystallised in the screen and stop indicator marketed by Penrose and Co. We have also had the Douthitt diaphragm control system introduced from America, and which is on the market at a price which certainly does not err on the side of cheapness

Both of these systems are designed with one object in view, that is, the simplifying of half-tone operating and the standardising of half-tone screen negatives, and it is possible, by comparison with the guesswork and rule-of-thumb methods still greatly in vogue, that they have both succeeded up to a point, but speaking quite without prejudice, I believe that both systems fail in several very important particulars. I have not seen the Douthitt system in use and therefore I may be speaking without my book, but I have studied the article by Ralph Grenell in the "Process Year Book," and if the stops and screen distances in his table C are the basis of the Douthitt system, then I can only say that it fails equally with the Smith and Turner system in its inability to make a half-tone negative from any given copy and extension, and with all screen rulings with the same stop and the same exposure. If this is not possible with any operating system, then, in my judgment, it fails.

The screen distances as advocated by Smith and Turner are based upon the usual equation with a stop proportion of 1-64, and they will probably produce satisfactory negatives, but not with the same stop and exposure for different screen rulings. For example, a certain stop, say, //32, is used with a 50-line screen at 16 mm distance, and a certain effect obtained. If a 200-line screen is used at 4 mm. distance, as advocated, then a stop half the size, *i.e.*, *f*/64, must be used to obtain a similar effect to the 50-line screen negative. This at once introduces a different exposure scale, which would vary with each ruling, and is not at all a simple problem, as the exposure in screen operating is not in proportion to the square of the aperture, as in ordinary photography. Exposure should be constant with all screen rulings, and all camera extensions, light and copy being equal.

For many years past writers upon this subject have accepted the pin-hole theory, but if this is correct, it can only be so with one size of stop at any one extension, and yet the same people who accept this pin-hole theory immediately advocate the use of two or more different sized stops in making a single exposure. If the screen distance is correct for one stop, it must be incorrect for any other, or, if the screen distance is set for a stop midway between two in use, it is incorrect for both, hence we have all the rigmarole of cutting and faking, and, as a consequence, false gradation. Why do operators find it necessary to use several stops to secure satisfactory dots at both ends of the scale? Because the screen distance is incorrect for either stop, or because the stops selected are incorrect for the tone scale of the copy. The only possible way to obtain correct gradation in a screen negative is by the use of one stop only.

It must be clearly understood that the whole of my remarks apply to dry-plate negatives; I have no interest in wet-plate half-tone operating, having cut it out more than 20 years ago, but I see no reason for believing that the same principles do not apply to wet plate. Judging by the questions that usually arise at lectures, I can only conclude that the majority of half-tone operators are still floundering, and have no very definite system of working, and that the wet-plate process has only survived because it lends itself so readily to the faking which has become a tradition in the trade. There is no theoretical reason why a dry-plate screen negative from any reasonable copy should not be perfect when it leaves the fixing bath.

In the early days of screen operating the phenomenon of diffraction attracted some attention, but it was apparently dismissed as of little importance. I have recently devoted a considerable amount of study to this branch of the subject, and I have come to the conclusion that diffraction plays a very important part in the formation of the half-tone dot and the gradation of the negative, and is, in fact, the crux of the question.

The amount of diffraction varies with the screen ruling, and is greater with fine than with coarse rulings. I have succeeded in measuring the diffraction sufficiently near to enable screen distances to be plotted so that negatives can be made from the same copy with 50-, 65-, 80-, 100-, 120-, 133-, 150-, 175- and 200-line screens, with the same stop, same exposure, and same development of the plate, and practically identical negatives are the result.

I should be glad to hear whether it is claimed that any other system can do this. E. A. BIERMAN, F.R.P.S.

FORTHCOMING EXHIBITIONS.

March 27 to April 8.—Dennistoun Amateur Photographic Association. Particulars from the Exhibition Secretary, Colin Graham, 448 Duke Street, Dennistoun, Glasgow.

March 28 to April 1.—Hackney Photographic Society. Hon. Secretary, Walter Selfe, 24, Pembury Road, Clapton, London, E.5.

April 5 to 8.—Leicester and Leicestershire Photographic Society. Particulars from the Hon. Secretary, W. Bailey, Cank Street, Leicester.

April 5 to 8.—Faversham Institute Photographic Society. Particulars from the Hon. Secretary, W. H. Evernden, 116, West Street, Faversham.

April 21 to May 11.—Hammersmith Hampshire House Photographic Society. Particulars from the Hon. Exhibition Secretary, J. Ainger Hall, 26, Bishop's Mansions, Bishop's Park Road, London, S.W.6.

May 1 to 6.—Photographic Fair. Horticultural Hall, Westminster. Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1.

September 9 to October 7.—London Salon of Photography. Latest date for entries, August 30. Particulars from the Hon. Secretary, London Salon of Photography, 5a, Pall Mall East, London, S.W.1.

September 11 to 15.—Professional Photographers' Association, Princes Galleries, Piccadilly, London, W. (Trade and Professional). Hon. Secretary, Richard N. Speaight, 157, New Bond Street, London, W.1. Also foreign invitation loan exhibition of professional portraiture. Hon. Secretary, Marcus Adams, 43, Dover Street, London, W.1.

September 18 to October 28.—Royal Photographic Society. Latest date for entries by carrier, August 25. Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

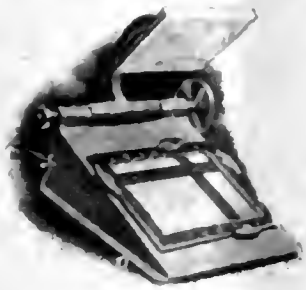
New Apparatus.

The Hodgson Printer. Made by The Hodgson Manufacturing Co., 2, Gerrard Place, Shaftesbury Avenue, London, W.1.

We welcome this new piece of apparatus, which is a machine of British design and construction, highly efficient for the rapid production of prints, and particularly for the printing of film-band negatives such as are handled in very large quantities during the summer season by those undertaking the supply of prints from

amateurs' negatives. We are particularly pleased to observe that in its design the machine strikes new ground. The user sits when working it; thus the comfort of the operator is consulted, and in this respect alone a greater output is obtainable in comparison with other printers, in the use of which an assistant becomes fatigued through performing long stretches of work whilst standing. Moreover, the machine leaves both hands entirely free for the manipulation of negatives and printing paper. As will be seen from the photograph, there are two foot pedals below the table. That on the right operates the electric lamps and pressure pad; that on the left raises the adjustable mask, which is a novel and essential part of the machine. Thus the worker has every opportunity for expeditious manipulation of the film negatives and for the feeding of the supply of printing paper.

The essential part of the machine is the printing bed and masking device shown on a somewhat larger scale in the second photograph. This is most solidly constructed of brass and aluminium, and is, in fact, an engineering piece of work which will last for years without getting out of order. Immediately above the glass bed of the machine is a metal frame, provided with a pair of sliding



metal masks, clearly shown in the illustration. These allow of masking from the smallest size up to the maximum size of negative accommodated by the machine, namely, half-plate. The construction automatically ensures that the masks are strictly at right angles wherever set, so that the printer obtains a perfectly rectangular picture on each piece of paper surrounded by a white margin. The edges of the frame which carry these masking strips are graduated so that the masks can immediately be set for any particular size of print of whatever shape. When in the down position the mask holds the negative firmly against the glass bed; for inserting a new negative or for shifting along a film negative band, pressure of the foot on the left-hand pedal slightly raises the mask, release of pressure fixing a fresh negative or the film-band in a new position.

The printing box is fitted with two 200 c.p. half-watt lamps, providing an average exposure of about one second on gaslight paper. Messrs. Hodgson have, however, provided a very ingenious movement, consisting in a switch by the operation of which the light from the lamps is dimmed so as to reduce the power and permit of convenient exposures from exceedingly thin negatives or when using bromide paper. The second switch, seen below in the first illustration, switches off all the lights from the machine. It is, of course, hardly necessary to say that the printing-box is fitted with an orange lamp, which is in circuit whilst the negative is being placed in position and the paper laid upon it, this orange lamp being automatically switched off when exposure is made by operation of the right-hand pedal.

We have nothing but praise for the design and construction of this machine, which is essentially a first-rate job, and embodies movements which are real savers of labour in this particular class of work. The outfit is mounted on a table of solid fumed and polished oak, and as shown, has the nests of shelves for the accommodation of negatives and unexposed and exposed printing papers. Without lamps the price of the machine is £14 14s. Lamps suitable to a customer's voltage are supplied at the prices of 7s. 6d. for each 200 c.p. half watt; 2s. 6d. for the orange pilot light.

The Apem Developing Tank. Made by Amalgamated Photographic Manufacturers, Ltd., 3, Soho Square, London, W.1.

In issuing this developing tank the makers have adopted the very excellent and convenient plan of providing a hanger or carrier for each plate or flat film. The twelve hangers rest on a projection within the tank so that they hang free with a clearance of a short distance above the bottom of the tank. Thus, by passing the hand over the stout wire handles of the hangers, the batch of plates can be most easily given the movement which is necessary to overcome stagnation of the developer, with its accompanying occasional evils

of band markings on negatives. Moreover, any given negative can instantly be withdrawn from the tank and as quickly replaced, being held up for examination without the fingers ever touching the developing solution. The tank is provided with an outlet at the bottom, closed with a screw cap when the tank is in use for developing; by removing the cap the tank may thus be used for washing purposes with a current of water passing through it by standing it under the tap. The tank is of nickel plated copper (the carriers of brass) and is provided with a loop lid which effectively excludes light, although the apparatus is, of course, primarily intended for use in a dark-room. In postcard size, fitted with twelve carriers, the price is 26s. 6d.; in half plate size, 31s. 6d.

New Books.

EARLY BRITISH TRACKWAYS. Mr. Alfred Watkins, despite advancing years and health which of late has not been of the best, must always be finding fresh outlets for his intellectual activity. The present volume is an expansion of a lecture delivered last year before a Hereford Naturalists' field club, in which Mr. Watkins described many observations which he had made on the ancient trackways of Britain in time probably long before the Roman invasion. And from those observations he has formulated a theory which sheds an interesting light on the long bygone inhabitants of this island, and incidentally adds to our knowledge of ancient landmarks, place names and other matters of antiquarian investigation. Mr. Watkins shows that the ancient trackways were always straight, apparently because they were sighted between two extreme points and then marked, as regards the intermediate distance, in some cases by stones which still remain. He displays a great deal of ingenuity in deriving a great mass of evidence from the antiquarian remains and from the names of places in Herefordshire. The original nature of the book will be appreciated by the antiquarian. The volume is illustrated by a large number of reproductions of photographs and by two plates of maps showing some of the ancient trackways. It is published by The Watkins Meter Co., Hereford, and by Messrs. Simpkin, Marshall, London. Price, 4s. 6d. net.

PHOTOGRAPHIC AMUSEMENTS.—Mr. F. R. Fraprie's firm, the American Photographic Publishing Co., 428, Newbury Street, Boston, Mass., has republished, with additions, the volume, "Photographic Amusements," by the late Walter E. Woodbury, of which numerous editions appeared years ago. There are, no doubt, many who will derive entertainment in the making of trick photographs such as those of frankly bogus spirits, double-pose and distorted portraits, etc., but the subjects of some of the chapters in the book, *e.g.*, those on instantaneous photography, telephotography and night photography would now hardly be classified as more or less frivolous reliefs from the ordinary branches of the art. That they seemed so thirty or forty years ago is simply a sign of the great advances which photographic technique has made since that time.

A.B.C. GUIDE TO AUTOTYPE CARBON PRINTING.—This publication of the Autotype Co., 74, New Oxford Street, London, W.C.1, has run through many editions since its first issue in 1887. Although more ambitious text books of the carbon process have been written it still remains as explicit and reliable a guide to the working of the process as can be had or desired. The present edition contains a chapter on the modern Carbro development of carbon printing, in which the tissue is chemically exposed in contact with a bromide print. The price of the manual is 1s. 6d., 1s. 9d. post free.

WISDEN'S CRICKETERS' ALMANACK.—Messrs. John Wisden & Co. send us a copy of the fifty-ninth issue of their "Cricketers' Almanack," again a bulky volume of 676 pages, which contains a full record of play during 1921, and copious personal particulars of notable cricketers past and present. The price is 5s. 6d. net, post free.

THE £3,000 COMPETITION.—A Bulletin dealing with the many features of this all-British competition is being issued during the present season from the headquarters of the competition, 4, Oxford Street, London, W.1. Photographic dealers throughout the kingdom should make a note of the multifarious programme which is being carried out for bringing the competition prominently to the notice of amateur photographers. Beginning with next month a series of advertisements will appear in the general Press in all parts of the country. Blocks are obtainable free for dealers' own local advertising, and there are also posters and window bills, a full supply of which is immediately obtainable by any dealer. One reminder made in the Bulletin is that many film cameras, such as the "Carbine" and "Ensign," become eligible for taking part in the competition if fitted with a plate adapter, the prizes in the competition being for negatives taken on plates. A series of slides for attachment to dealers' correspondence is also obtainable from the competition headquarters.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, APRIL 3.

Forest Hill and Sydenham P.S. Print and Lantern Slide Competition.
Glasgow and W. of Scot. Amat. P.A. "Photographic Emulsions." A. Dowie.
Southampton Camera Club. "Some Pictures I Like, and Why." F. G. Ryder.
South London P.S. "Picture-Making at Home and in the Field." G. C. Weston.
Walthamstow P.S. "Colour Photography." E. Willcocks.

TUESDAY, APRIL 4.

R.P.S. "Imaginative Portraiture." H. Lambert, F.R.P.S.
Bournemouth C.C. "Through the Grecian Archipelago." Messrs. Butcher.
Cambridge Phot. Club. "The After-Treatment of the Negative." A. Dordan Pyke.
Exeter Camera Club. "Exposures." Dr. C. Beauchamp-Hall.
Hackney P.S. A Southdown Ramble. A. H. Page.
Rotherham Phot. Soc. Annual Meeting.
South Shields P.S. Free-Lance Talk on Picture-Making. E. A. Black.
Tyneside Phot. Soc. General Meeting.

WEDNESDAY, APRIL 5.

Croydon C.C. "Photography and Crime." G. H. Gardner.
Edinburgh P.S. "Photogravure Process." V. L. Alexander.
Ilford P.S. "Commercial Enlarging—With a New Method of Testing Exposure." N. K. Jackson.
Partick Camera Club. Flashlight-Night. John Roberts.
Rochdale Amateur P.S. "The Merits of Various Types of Cameras." H. and W. Bamford.

THURSDAY, APRIL 6.

Gateshead Camera Club. ——. G. Ternent.
Hammersmith Hampshire House P.S. "The Value of Failure." E. C. Perry
Letchworth C.C. "Photographic Apparatus." A Dordan Pyke.
Tunbridge Wells A.P.A. "Architecture." A. G. Wood.

SATURDAY, APRIL 8.

Hackney P.S. Outing to Greenwich.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday March 28, the President, Mr. W. L. F. Wastell, in the chair.

The chairman referred to the loss which the Society would sustain in the departure of Mr. Renwick, through the latter's leaving England. Mr. Renwick had taken a most active interest in the Society, and was particularly identified with the foundation and organisation of the Scientific and Technical Group. As that was perhaps the last occasion on which Mr. Renwick would be present, he expressed the good wishes of the members for his prosperity and happiness.

Mr. Arthur C. Banfield was unable to read his paper on the Trist three-colour camera, owing to the fact that the camera was unexpectedly not available. By way of a substitute, Mr. Banfield showed a new design of prism spectroscope of Messrs. Adam Hilger's. It was built in the form of a microscope, and was fitted with the Hilger attachment for indicating the Angstrom numbers of the lines.

Two papers dealing with the Osglim lamp were then read by Mr. Ryde, representing the General Electric Co., and Mr. B. V. Storr, of Messrs. Ilford, Ltd.

Mr. Ryde explained the principle of the lamp, viz., the luminescence of a rarefied mixture of a mixture of neon and helium gases under a given electrical pressure.

Mr. Storr described the results of some provisional tests on the use of the lamps in dark-room illumination. Although the light was chiefly red and yellow, there was a bright blue line in the spectrum, so that a pale yellow filter was needed in order to make the light safe for such sensitive materials as ordinarily could be developed in bright orange light. Even so, he found that the greater safety for equal brightness (or *vice versa*) could be obtained by the use of an ordinary metal-filament lamp.

Dr. Higson said he made the lamps safe by coating the bulbs with eosine-gelatine solution, which cut out the blue and violet. To cut out the yellow also, he added a coating of methyl violet.

Votes of thanks were accorded to the lecturers and demonstrators.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

The meeting of the Council, adjourned from March 10, was held on March 24, at 35, Russell Square, when there were present:—

Messrs. Marcus Adams, Angus Basil, Arthur Bennett, Frank Brown, W. B. Chaplin, Gordon Chase, Alexander Corbett, C. F. Dickinson, Alfred Ellis, Reginald Haines, George Hana, Richard N. Speaight, H. C. Spink, H. A. St. George, and F. G. Wakefield, with Lang Sims, secretary.

Mr. Alfred Ellis took the chair.

The Secretary announced apologies for absence from the President (Mr. Swan Watson) and Messrs Chapman, Gray, Lambert and Turner.

The minutes of the previous meeting were taken as read.

Finance and Propaganda Committees.

Mr. Speaight said that Mr. Hana had placed before him certain figures relating to the proposed "Record," which had completely satisfied him as treasurer, and had satisfied also his colleagues on the Finance Committee. That being the case, in accordance with his promise on the last occasion, the new venture would have no more hearty supporter than himself. (Applause.) He proposed: "That the new publication should be issued monthly, and that the Propaganda Committee proceed."

Mr. Chase seconded, and this was agreed to unanimously.

Some discussion ensued on the preparation of literary matter for the "Record" and the appointment of an Editor. Mr. Hana detailed the inquiries which the Propaganda Committee had made on this subject, and it was understood that the Committee would at a later stage bring forward definite proposals.

Congress and Exhibition.

On the report of the Combined Congress Committee, which was brought forward at the previous meeting of the Council, Mr. Wakefield reported progress with regard to the arrangements for stands for trade exhibitors.

Mr. Speaight, Mr. Haines and others reported with regard to the particular arrangements of which they are in charge.

Message to American Congress.

Mr. Haines asked whether the message which the Council at the last meeting had decided should be sent to the American Congress meeting early in May had been dispatched.

The Secretary said that this had not yet been done, but that, as instructed, the Chairman, Treasurer and Secretary would draft an appropriate message to be sent in time.

Next Meeting of Council.

The Chairman drew attention to the fact that the date at which the next Council meeting would ordinarily fall was Good Friday. It was agreed that the meeting should take place on the Friday following—that is, April 21.

Correspondence.

The Secretary read letters from members in which questions of dispute as to charges or requests for information had been dealt with by him to their satisfaction. A letter was read from a Press Agency regarding the reproduction by two illustrated papers of separate pictures taken from a group, the work of a London photographer, with regard to which the newspapers claimed, so it was stated, that the one fee of 17s 6d. paid for the group should include the payment for all the separate pictures. On the proposition of Mr. Basil, seconded by Mr. Haines, it was agreed that the Secretary should ask for an interview with the art editors of these newspapers and ascertain whether the facts were as alleged by the Agency, and, if so, that the injustice of the procedure should be pointed out to them. The Chairman suggested that the photographer should also be seen on the subject. It was agreed to thank the Press Agency for bringing the matter to the Council's attention.

A letter was read from the Federation of Master Process Engravers urging that some means should be taken, if possible, of bringing about a reduction in the prices of photographic materials. It was agreed, on the proposition of Mr. St. George, to reply that if the Federation could suggest some means whereby such pressure could be brought, the Association would be glad to co-operate.

Appointment of Chairman.

Mr. Ellis said the next business was the appointment of chairman; he did not intend to seek re-election, and he had to thank the Council for the patience and courtesy extended to him during his twelve or thirteen years of office. (Applause.)

Mr. Speaight took the chair *pro tem.*

Mr. Frank Brown proposed a hearty vote of thanks to Mr. Ellis. He had never come across a more able or affable chairman; he hoped that Mr. Ellis would continue a member of the Council.

Mr. St. George seconded. The office had not been easy to fill, but Mr. Ellis had filled it to the general admiration.

The vote of thanks was carried unanimously and with applause.

Mr. Speaight proposed the election of Mr. Alexander Corbett to the chair, and this was seconded by Mr. St. George and carried unanimously, also with applause. Mr. Corbett then took the chair and said how much he appreciated the honour done to him.

Appointment of Secretary.

Mr. Lang Sims said that there had been a meeting of the Finance Committee, and he had been given a synopsis of what was agreed to with regard to the appointment of secretary. He thought the terms for the duties laid down under the new articles were adequate and generous. It was not his intention, however, to remain in office; he resigned at that meeting. His appointment was due actually to terminate that day, but if it was desired he would remain in office for one week longer. He was sorry that he could not say the kind things Mr. Ellis had said; he had a certain amount of regret at going, but he quite definitely resigned.

Mr. Speaight said that he was sorry for the resignation of Mr. Sims. No man on the Council was more valuable than the retiring Secretary; if his resignation was definite he wished to thank him personally and as treasurer for the help he had given. (Applause.)

Mr. Hana supported Mr. Speaight's remarks. There was no doubt as to Mr. Sim's great ability and prestige, and they only hoped his successor would do as well.

Mr. Sims thanked Mr. Speaight and Mr. Hana. He had done his best. The books of the Association were now in thorough order.

The Chairman hoped that Mr. Sims would still remain on the Council. Mr. Basil proposed that, under Article 40, Mr. Sims be co-opted a member of the Council on his retirement. Mr. Speaight seconded, and this was carried unanimously.

Mr. Sims thanked the members.

Mr. Hana proposed Mr. Alfred Ellis for the post of secretary. He could not conceive any man more capable of the office. Mr. Adams seconded, and Mr. Frank Brown, as a country member, warmly supported the nomination; on being put, it was unanimously carried. Mr. Ellis said that he accepted the office and agreed to the conditions laid down by the Finance Committee. He rejoiced to think that he was back in the post he occupied just about 21 years ago, and he promised that he would do his very best to start the new Association and help to make it even more successful than the old. (Applause.) He tendered his resignation as a member of the Council.

Other Business.

Other matters considered were a letter to be sent to Mr. Kaye, of Manchester, with regard to a proposed meeting of photographers in that city.

An informal discussion then ensued on the instance of Mr. St. George, with regard to the scales of minimum prices for commercial photography, which was adjourned to the Council meeting on April 21.

CROYDON CAMERA CLUB

"Novelties and home-made apparatus" were considered last week.

The president, Mr. John Keane, first showed the "Luxol" portable dark-room lamp, which burns ordinary paraffin oil held by absorbent material. Many members had employed it with satisfaction, and the safety of the ruby glass was vouched for by Mr. Hibbert, who had tested it.

Next came Griffiths' "Fortex" valve for adding many useful exposures, from ½ second to 3 seconds, to cheap shutters. Mr. Harpur, with a York fireman's long view of things, maintained the 3 seconds was far too short. Careful tests with stop watches proved the instrument to be correct. Specimen prints on cream "Noctona," a recent introduction of the same firm, followed, a

welcome variety of an excellent product. Cheers greeted the production of a large parcel of free samples with developer complete.

Mr. F. Ackroyd showed electric torches fitted with hand-operated miniature dynamos, and an excellent way of converting, by means of a file, old-pattern Gillette safety-razor holders into the latest improved model. How many patents this procedure infringes he did not mention.

Mr. E. A. Salt proudly exhibited a dust cap for bottles improvised out of half of a capped tube in which upright incandescent mantles are supplied. A slip of gummed paper holds the cap secure on the tube.

Mr. Vivian Jobling alleged that the full merit of this remarkable invention was due to him, and him only, which long-prior publication proved. He regarded Mr. Salt as a pirate of the worst description. The latter, in turn, said he felt saddened at the unblushing sacrifice of truth to envy, by one whom previously he had held in some respect.

Mr. B. J. Rose interrupted further compliments between the rival inventors by mentioning he had applied the revoluntary principles of "Intimate Photography" to pinholes. Among other examples he showed a portrait on a quarter-plate taken with a pinhole 1/50th inch in diameter, 2 inches from the plate, and 6 inches distant from the sitter's nose. In a conservatory, medium light, one minute was given on an Imperial S.R. plate. For texture, and emphasis of the near features, and abrupt recedence, the striking production crowded out Mr. C. P. Crowther from his own pet preserves.

Anyone who wishes to produce an exceedingly funny result has only to follow in Mr. Rose's steps, and might even go one better with a pinhole 1½ inch distant from the plate, and proportionally nearer the nasal organ of the sitter. Actual contact is to be avoided as unduly prolonging exposure. The amount of the victim included can be ascertained with a larger hole. Mr. Rose employs holes up to ¼ inch, dependent upon their distance from the plate.

Another tip of his was a cheap and good dead-black for woodwork—to wit, Bowman's solid ink stencil-black. It is sold in flat tins, and is best applied with a stencil brush.

Many ingenious contrivances were shown by Mr. Jobling, including efficient shutters and camera fittings, all requiring drawings for description. Later in the evening, when kindly attempting to explain "shutter efficiency" and "equivalent exposure" to a professional member, the latter suddenly remembered an immediate engagement elsewhere, and left with corrugated brow.

Mr. Handel Lucas brought an interesting evening to a close by introducing the subject of three-colour photography. Many years ago, listening to a lecture by a member, he had been much struck with its possibilities, and subsequently has discarded palette and brush for the art of the camera, which he held to be truer to Nature, a somewhat provocative dictum which was not taken up.

Many examples of a secret colour process with photographic basis worked out by him were passed round, and though apparently having no connection with three-colour work in any form, they were undeniably fine in all respects. Much insistence was laid on the necessity of a black key to coloured pictures, and ingenious arguments were advanced in support. Incidentally, it happens to be a necessity in the process evolved by him

Commercial & Legal Intelligence.

Legal Notices.—At an extraordinary general meeting of the members of the Premier Animated Photo Co., Ltd., held at 6, Quality Court, Chancery Lane, W.C., a resolution was passed to the effect that the company be wound up voluntarily, and that Mr. Arthur William Love, 61, High Street, Walton-on-Thames, Surrey, be appointed liquidator.

NEW COMPANIES.

Camera Craft, Ltd.—This private company was registered on March 20, with a capital of £1,500 in £1 shares. Objects: To take over the business of photographers and dealers in photographic supplies carried on by C. A. Hornby and E. J. Chard at 35, Queen's Avenue, N.21, as the "Camera Craft Service." The first directors are: C. A. Hornby, 88, Fernleigh Road, Winchmore Hill, N.21, photographer; E. J. Chard, 47, Old Park Road, Palmer's Green, N., photographer (both permanent, subject to holding £50 shares each). Remuneration as fixed by the company. Registered office: 1, Osbourne Road, Palmer's Green, N.13.

News and Notes.

Correction.—In the paragraph on page 165 of our issue of last week, March 24, an error occurred in specifying the components of the Ferguson copper toning bath. "Ferrocyanide" should, of course, have been "ferricyanide."

Mr. Percy J. Slater, Sawtry, Peterborough, sends us his latest price-list for enlarging and printing in bromide, the tariff representing substantial reductions of charges. Discounts allowed to bonâ-fide professional photographers may be obtained on application.

Nobel Industries, Ltd.—A booklet descriptive of the branches of manufacture in which this amalgamation of many firms is concerned has just been issued from the head offices, Nobel House, Buckingham Gate, London, S.W.1. Among the firms comprised in the Nobel Co. is Necol Industrial Collodions, Ltd., manufacturers of collodion and Necoloidine for photographic and microscopic work.

Brighton Beach Photography.—Brighton beach traders are apparently expecting a good summer, for when "pitches" were offered by auction last week the total realised £2,510 for 91 stalls; this compares with £1,122 for 83 stalls last year. There were 12 photographic pitches sold, they fetching a total of £390. Bournemouth stands were sold on the same day, the 30 realising £2,474, as against £775 last year, but the number of photographers and the prices paid were not stated.

Photographic Fair.—It is announced that a special concession will be made to professional photographers visiting the Photographic Fair, to be held at the Horticultural Hall, Westminster, from May 1 to 6, in the shape of the issue of a season ticket for the week at the nominal price of 1s. The ordinary single admission to the Fair is 1s. 6d. Professional photographers thus secure admission to the Fair at any time during the six days it remains open by applying beforehand to the Secretary of the Fair, Sicilian House, Southampton Row, London, W.C.1. This concession is made only to bonâ-fide professional or trade photographers, who should make application upon their ordinary note heading.

Raw Photographic Base Paper.—The announcement is made in the "Financier" of Wednesday last of a provisional agreement for a fusion of their interests between the two paper-making firms of Wiggins, Teape and Co. (1919), Ltd., and Alex. Pirie and Sons, Ltd. Both firms are of old and high standing in the paper trade, and both within the last few years have taken up the manufacture of raw photographic paper base. Messrs. Wiggins, Teape, a year or two ago, laid down a factory for this branch of their business at Woburn, Bucks., and Messrs. Pirie have done the same at Aberdeen, through the medium of Pirie's Photographic Paper Co., Ltd., the shares of which are largely held by the parent company.

The Scottish Federation.—The Blue Book for 1922-23, of the Scottish Photographic Federation, is once again a full and useful record of the activities of the Association, and of the help which it extends to photographic societies north of the Border. It contains a list of federated societies, of lecturers, demonstrators and experts whose services are available, and a score or more of pages briefly itemising the scenic attractions of places in Scotland, with particulars of dark-rooms and of members of the Federation, from whom further particulars can be had. The hon. secretary, Mr. James W. Mackenzie, 153, Hope Street, Glasgow, is always willing to give his help to photographers seeking a club or having the intention of establishing an Association.

Testing Paintings by Photography.—Photographic tests which enabled experts to tell genuine old masters from copies were described by Prof. A. P. Laurie at last week's lecture before the Royal Society of Arts. The first step in the examination of a picture, he said, was to go over the surface with a microscope to find possible repaintings and also to ascertain if the signature had been added at a date later than the painting. The pigments were next examined to decide the date of the picture. In some cases a tiny microscopic sample might have to be removed. The actual painter was discovered by means of enlarged photographs of typical pieces of brush work. Portions of pictures by the supposed painter, which were universally accepted, were in the first instance photographed and then enlarged, and afterwards carefully compared with similar ones of the picture under examination. These photographs were also compared again with the original pictures, and finally the prints were cut to pieces, and portions of the

brush work from undoubted pictures pasted on to suitable places on the prints of the picture to be identified, and these made-up prints again photographed. As an illustration of these methods (says the "Daily Chronicle" report) he showed photographs of the brush work of Watteau and of a copy, photographs of the Rokeby Venus, the Spanish Admiral, and the "silver" portrait of Philip. He pointed out how it had been possible to prove the date of the painting of the Rokeby Venus within some 30 years, and, also, that the Cupid was painted at the same time. A series of enlarged photographs of well-known Rembrandts and one or two of his followers were exhibited, and the professor demonstrated by means of this method that "The Good Samaritan" in the Wallace Collection was painted by Rembrandt.

Correspondence.

**** *Correspondents should never write on both sides of the paper.*
No notice is taken of communications unless the names and addresses of the writers are given.

**** *We do not undertake responsibility for the opinions expressed by our correspondents.*

KEEPING TO ONE SHUTTER-SPEED EXPOSURE.

To the Editors.

Gentlemen,—I learn from the Croydon Camera Club's report on page 176 of last week's issue of the "B.J." that the simple system of exposing advocated by Mr. W. Sanderson rather upset the equilibrium of some of Croydon's pundits. Their criticisms were no doubt due to the fact that the system has not been tested by them because of lack of facilities, the system not being quite so easy to work in the ever-changing English climate as it is under the sunny skies of Italy, where at times the light is remarkably constant in quality.

It has been my lot to make some hundreds of hand and stand camera exposures in Italy, and some thousands of exposures in lands nearer to the equator, and experience has taught me the value of the one shutter-speed of working. Mr. Sanderson's speed, it appears, was approximately 1/100th of a second, whereas my standard speed was 1/60th. When the subject was of such a character as to necessitate longer or shorter exposures, such alterations were brought about by the simple act of altering the size or value of the stop, the standard exposure of 1/60th being that most suitable for *f*/8, and for the ordinary plates I invariably used. I will not insult your intelligence by telling you exactly how I regulated exposures by the use of stops larger and smaller than *f*/8. All I want to do is to record my support of a system which I believe is too little known, or, at any rate, too little practised.

Even to-day, and here in England, I always keep the shutter of my Presaman reflex set at 1/30th of a second, and invariably use it at this speed, manipulating the stops to suit the light and the plate.

The system is of the utmost value, and there is much more in it than many imagine, and some day perhaps you or someone else will deal fully with the theoretical side of it. Expert workers like Mr. Sanderson know the practical side of it, as also do several less-experienced workers like myself, and the Croydonians would do well to sit up and take a bit of notice of what appears to them to be a new idea.—Yours truly,

I. T. Woods.

MEASURING FOCAL LENGTH OF LENS.

To the Editors.

Gentlemen,—In answer to Mr. W. E. Debenham's letter in your last issue. Both Mr. Jobling and I quite recognised that any special apparatus for measuring the focal length of a lens must have limited application, and little if any, to the professional photographer. Still, there are many amateurs who take a pride in constructing apparatus, and that described by us would be welcomed by members of photographic societies.

The accuracy of Clay's method was confirmed by tests with high-grade anastigmats engraved with their focal length, the readings of the home-made appliance exactly coinciding.

As suggested by Mr. Debenham, tests to check the accuracy of the method mentioned, and first published by him (who has done much useful work in the past in extending optical knowledge), certainly would be interesting. The exigencies of other affairs hardly permit me to undertake the job. Possibly some reader might do so, and publish results.

It, however, seems to me that the accuracy of any method of determining focal length dependent upon the measurement of scale images on the ground glass of the camera will turn on the personal equation of the operator; also, that measurements will be vitiated with lenses possessing distortion unless a very small angle be included, which adds to likelihood of error.

But, for all practical purposes, the simple plan proposed by Mr. Debenham will meet most requirements, especially those of the professional photgrapher, who in the studio is working with ever-varying camera extensions.

Such a method, of course, does not directly indicate the position of the node, but the table furnished some time ago by the Editor of the "B.J.," giving the position of the node in many types of lenses in common use, can be consulted. Unfortunately the figures given are in relation to lenses of varying foci, involving a little calculation for other focal lengths. The adoption of unit focal length would have been more convenient.—Yours faithfully,

E. A. Salt.

Sanderstead, March 24

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION OF GREAT BRITAIN AND IRELAND, LTD.

To the Editors.

Gentlemen,—Will you kindly allow me, through the medium of your paper, to make known to the members of the P.P.A. that Mr. Lang Sims having resigned the secretaryship of the Association, the council have appointed me to the post. All communications, therefore, for "The Professional Photographers' Association of Great Britain and Ireland, Ltd.," should now be addressed to me at the address below.—Yours faithfully,

Alfred Ellis,
Secretary.

2, Vinery Villas, Hanover Gate, N.W.8.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; Recent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

G. A.—Particulars of the lamp to which you refer can be obtained from Mr. D. Charles, 50, Webb's Road, Clapham Junction, London, S.W.11.

R. B.—The statuettes to which you refer are made (under the name of "Panel-Photettes") by Mr. A. Smith, 107, Melbourne Grove, East Dulwich, London, S.E.22.

F. H.—The process for red tones is to sepia tone by the usual method of bleaching with ferricyanide and bromide and treating with sulphide, and then to tone the washed prints in an ordinary gold sulphocyanide bath, as used for the toning of P.O.P.

J. S.—For large heads where the distance between the camera and the sitter is comparatively small, there is a material advantage in the use of a 20-inch lens over a 16-inch, and still more over a 12-inch, but for full lengths, or even half lengths, in cabinet size there is no substantial advantage in using a longer focus lens than 12 inches.

W. F.—The orthodox material for belts in print dryers is a fine surface white duck. Of the materials you mention, not only are the surfaces unsuitable, but they would not keep their shape

for any length of time. Whatever material you choose must be pure linen as cotton or wool would not absorb the moisture quickly enough.

R. R.—For copying blue prints so as to get good contrast between the blue ground and white lines you want to use a filter, such as the Wratten A or F, in conjunction with a process panchromatic plate. You can buy the filters in film form fairly cheaply. Prices and information from the Wratten Division of Messrs. Kodak, Ltd., Kingsway, London, W.C.2.

W. K.—You do not need to do anything to secure the copyright in your views. The mere fact that you have taken them "on your own" creates the copyright as your property. There is nothing in copyright law nor in common law to prevent you taking views from such standpoints that your prints will be substantially the same as those taken by other people.

R. C.—There is little doubt but that your trouble is caused by bad fitting or the focussing adjustment which allows the back to run in slightly when the slide is inserted or moved. If it is a rack adjustment, lift the rack and put one or two strips of brown paper under it. If a screw, you will probably want a new brass nut. Many cameras are fitted with a clamping screw to prevent slipping in this way.

W. J.—So far as anyone preventing you from making or marketing the printer which you describe, that is solely a question of whether the device which you use has been patented. It would probably take a long time to examine the patent specifications which have been published, but it would be quite easy for you to do it with the assistance of the librarians in the Patent Office Library, which is open free to the public, at 25, Southampton Buildings, Chancery Lane, W.C.2.

W. A.—For formulæ and instructions in making emulsions you want one of the old editions (about 1880 to 1890) of Abney's "Instruction in Photography" or Abney's "Photography with Emulsions," both of which are long out of print, but obtainable from Messrs. Foyle, 121-123, Charing Cross Road, London, W.C.2. These manuals describe the making of a comparatively slow emulsion. There are no published particulars for the manufacture of the modern high-speed emulsions.

L. B.—The question you place before us is clearly one which can only be dealt with by a solicitor who is in possession of all the essential facts relating to a business. If the concern is a limited company you can, of course, buy as many shares as any present holder may care to sell you. You will then share the profits pro rata. We cannot see what benefit will accrue to the present owner of the business by taking a partner, unless the partner does the work of the manager, who would then be dispensed with.

R. M.—An excellent general book on composition in landscape and portraiture is "The Appeal of the Picture," by F. C. Tilney, published by Messrs. Dent and Sons, Ltd., 10-13, Bedford Street, Strand, London, W.C.2. Other books are "Picture Making by Photography" and "Pictorial Effect in Photography," by H. P. Robinson, and "Practical Pictorial Photography," by A. H. Hinton. Prices from about 1s. 6d. to 3s., from Iliffe and Sons, Ltd., 20, Tudor Street, London, E.C.4. If out of print, you could get them from Messrs. Foyle, 121-123, Charing Cross Road, London, W.C.2.

W. T.—There are few varnishes which will stand both acids and alkalies. One made of gas tar and naphtha (the ordinary burning variety) mixed in equal parts immediately before use, has been found to answer well, as does one composed of asphaltum, 4 ozs.; pure rubber, 30 grs.; mineral naphtha, 10 ozs. Give three coats with a stiff brush, drying after each. The rubber is to keep the asphaltum from chipping. Asphaltum is a fairly pure form of asphalt or bitumen. It is not usual to waterproof teak tanks or dishes, as, if well made, they are usually more watertight without.

M. E.—There is nothing for your purpose whiter than white distemper, but you must have a full light upon it, as white in shadow comes out grey. We recommend you to procure "Sketch Portraiture," by J. Spencer Adamson, issued by our publishers, price 1s. 3d. post free, which deals fully with the subject of white backgrounds. There is, so far as we know, no directory devoted to photographers. Kelly's directories for the various districts include them, as does also the same firm's "Directory of the Chemical Industries." Address: Kelly's Directories, Ltd., 186, Strand, London, W.C.2.

N. J.—A formula for combined developer and fixer is as follows:—

Water, to make	40 ozs. fluid.
Hydroquinone	½ oz.
Soda sulphite	4 ozs.
Soda carbonate	4 ozs.
Hypo	8 ozs,
Liq. ammonia .880	2 fl. ozs.

Addition of more ammonia to the developer gives more vigour. The plates develop (and partly fix) in two or three minutes. They can then be examined in daylight and fixed in plain hypo.

G. T.—For the literature of making relief prints we may perhaps refer you to an article by E. J. Wall in the "Colour Photography" Supplement to the "British Journal" of August 5 and September 2, 1921. This refers particularly to the use of peroxide in making reliefs. These reliefs are, of course, exceedingly shallow, and there is, in fact, no very practical process of making really considerable reliefs. The best method for this purpose consists in the use of a thick gelatine film sensitised with bichromate as employed in the Woodbury process, but the method is by no means easy to work. For information concerning it there is no better book than "Photographic and Photo-Mechanical Printing Processes," by W. K. Burton, now out of print, but obtainable from Messrs. Foyle, 121-123, Charing Cross Road, London, W.C.2.

W. G.—Your room is hardly suitable for full lengths, partly on account of the absence of a sufficiently high side light (your highest point being only 6 ft. 5 ins. from the floor), and partly because of the short working distance, which would only be 9 ft. between lens and sitter; this is allowing 2 ft. for the sitter and 3 ft. for the camera and operator. This would only allow you to use a lens of 6½-ins. focus, which might do for cheap work, but certainly not give good perspective. You would require at least an 8½-in. lens for heads and three-quarter lengths. If you could fit a couple of 1,000-c.p. half-watt lamps fixed close to the ceiling to give top light you could manage the lighting for full lengths; without them you should only attempt sitting figures. A reflector is easily made of a light frame, about 6 ft. by 2 ft. 6 ins., covered with white calico with a couple of hinged struts behind. Lace curtains would hardly be satisfactory; plain white muslin or nainsook would be better. Any of the developers mentioned would answer for portraits, they should, however, be more dilute than for outdoor work. It is not so easy to get good vignettes on bromide paper, as you are using a more concentrated light than daylight. You must have a good distance between the vignette card and negative, say, 2 ins., the opening in the card should be covered with very thin tracing paper or ground glass, and the light should be diffused by a ground glass screen close to the lamp. Plate glass treated with dilute ox-gall will give the best gloss, but ferrotype plates answer very well, and only require an occasional polish with the merest trace of ordinary petroleum.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3231. Vol. LXIX. FRIDAY, APRIL 7, 1922. Price Fourpence.

Contents.

SUMMARY.

In consequence of the Easter holidays the "B.J." will be published a day earlier next week, and, therefore, line advertisements for insertion in next week's issue (April 14) must reach our publishers not later than 12 (noon) on Tuesday next, April 11.

M. L. P. Clerc has worked out formulæ and a table for the conversion of plate speed numbers according to the five systems in current use in this country and on the Continent. (P. 200.)

Mr. A. Lockett describes a simply made appliance for the measurement of effective diaphragm aperture of lenses. (P. 199.)

At the Royal Photographic Society, 35, Russell Square, there is now being shown a remarkably fine collection of photographic portraits by Dr. Henry B. Goodwin, of Stockholm, who, at next Tuesday's meeting of the Society, will lecture on "Photographic Portraiture Pure and Simple." (P. 201.)

On page 198 we refer to the shortcomings of much modern portrait work and point out the way to attaining a higher level.

Some notes on finding models for head and shoulder studies are contributed by a correspondent. (P. 200.)

The business to be done in making semi-transparent prints for use as window advertisements is emphasised on page 198, where some hints are given on the method of their production.

Prices paid for photographic pitches on the Bournemouth foreshore will be found on page 205.

A correspondent states his experience of the relatively rapid fading of platinum toned bromide prints. (P. 207.)

The use of a plain glass flat filter when using similar light-filter flats in the camera is the subject of a paragraph on page 197.

Mr. E. J. Wall returns to the discussion of priority in inventions in colour photography. (P. 206.)

"COLOUR PHOTOGRAPHY" SUPPLEMENT

Mr. E. J. Wall contributes an historical review of the origin and early development of the Photochromoscope. (P. 13.)

It is announced that a comprehensive treatise on colour photography by Mr. E. J. Wall is in the press in the United States. (P. 16.)

Details of the Triadochrome process of making three-colour prints, worked out by Mr. J. F. Shepherd, of which a short account appeared a month or two ago, will be found on page 15.

A recent patent specification, granted to Miss Florence M. Warner, formerly associated with the Warner-Powrie process, describes a system of screen-plate colour photography, according to which an emulsion coated screen plate is developed to a négative in complementary colours and from it is printed (on a panchromatic plate) a positive transparency, which is then bound up in register with a mosaic colour screen. (P. 14.)

EX CATHEDRA.

A Colourless Light-filter. Photographers and process-engravers who handle any quantity of colour work now and again come up against a problem which would not exist were a plain glass of the same thickness as the coloured filters recognised as an essential item of a set of "flats." One is sometimes called upon to make a pair of negatives, for instance, for a two-colour job, one of which must be made through a filter, while the other is best made on an "ordinary" or even a process plate. Or it may be that a line negative is required to register correctly with a colour set. If the process plate is made without a filter it is practically certain to be out of register, unless gelatine filters have been employed for the panchromatics. Sometimes, also, when the original is of a heavy character, or when the light is not of the brightest, focussing with a tricolour filter is anything but an easy matter, even to the keenest sight, and here again the plain glass will permit focussing to be done under the best possible conditions, with the certainty of obtaining sharpness without having to stop down further than is absolutely essential. Those who are familiar with the lengthy exposures sometimes called for in colour work will appreciate the advantage of the last point.

* * *

Current at Power Rate. The letter from Messrs. Wykeham Studios, Ltd., which appears on another page, raises a question of great importance to every portrait photographer, namely, the supply of current which is used in a photographic establishment for purposes other than those of ordinary illumination—the supply of such current at power rate. It will be seen that Messrs. Wykeham's Studios are resisting the imposition of a charge considerably below that for ordinary lighting, yet considerably above that which is commonly charged for "power." In so far as the legal dispute may relate to particular matters applying only to them and to their electrical suppliers, it would not be proper, we think, for us to comment upon it. But inasmuch as their resistance is designed to create a test case in which the question of the rate at which current for photographers' portrait and printing lamps and for other electrical appliances used by them in the production of photographs, shall be explored, there appears to be justification for drawing attention to the impending proceedings and for asking, on behalf of Messrs. Wykeham Studios, the support of photographers generally. That support may be given either in the shape of information as to "power" rates charged by other electrical undertakings for such purposes as we have mentioned, or of financial contributions to the costs of an action which, if decided in the favour of the photographers, may be of far reaching benefit to studios throughout the country.

Transparency Prints. In a recent issue of "Studio Light" attention is directed to the real opportunities for additional business on the part of a studio in the supply of semi-transparent prints for exhibition, in shop windows and other places, by transmitted light. In the daytime, under the ordinary illumination, the prints have the appearance of an ordinary photograph. It is found that the best means of rendering the prints semi-transparent is the somewhat heavy white mineral oil (liquid paraffin) commonly sold for medicinal purposes. The method of applying the oil is to brush over the back of the print with it and allow to stand for one hour. The process is then repeated, the print left to itself over night and excess of oil removed with a cloth the next morning. No advantage is gained by applying oil to the gelatine side of the print. With most papers the graininess of the paper itself is not exaggerated by treatment with the oil, providing the paper is dry; dampness is a cause of graininess. As a rule, full exposure and development require to be observed in order to obtain a print with ample deposit of silver in the shadows. Should it be required to attach the oiled print to glass, a suitable adhesive is made by swelling 125 grs. of gelatine in water, pouring off the surplus water, heating until the gelatine melts, adding 30 grs. of sugar, and making up to 3½ ozs. with water. Both the print and the glass are coated with the hot adhesive and squeegeed into contact.

PRESENT-DAY TECHNICAL QUALITY.

A COMPARISON between the quality, from a technical point of view, of the average of current portrait work and that of twenty-five years back appears to indicate that while there has been great progress in the artistic quality there has been an almost corresponding deterioration in the actual technique, as shown in the prints. This is the more surprising, as the makers of plates and paper have done everything possible to make the production of good work as simple as possible, although it is, perhaps, this very fact which has been the primary cause. In the earlier days, when the photographer had to prepare his own plates and usually to sensitise his paper, a long and painful novitiate had to be passed before even a passable result could be obtained, but the ease with which photographs can now be produced seems to have engendered a disinclination to take even a moderate amount of pains to get good results and to expect the manufacturers to supply materials which will make up for any amount of ignorance and carelessness in the studio and workroom.

Photography differs from most other arts and crafts, inasmuch as few of its practitioners have received any systematic training or have served any sort of apprenticeship. A natural taste for the work, with perhaps a little success as an amateur, is often deemed sufficient as a preliminary to taking the plunge into professional portraiture, so that it is hardly surprising that excellent apparatus and materials are not used to the greatest advantage.

It may be of interest to examine the various weak points of many workers categorically, and a start may be made with focussing, which is often faulty. As a rule the tendency is now to use a much larger lens aperture than was the case formerly, so that the greatest care is necessary to define the points of interest in the subject. We have noted in work bearing well-known names such laches as unsharp eyes while the hair and clothing are in focus; or shapeless hands due to neglect of the swing-back or diaphragm. Such negatives which would once have been ruthlessly destroyed are now tolerated, with a resulting loss of reputation which is not always realised by the operator.

Correct exposure is not such a matter of course as it should be. To our knowledge many otherwise clever operators fail in this direction, either from sheer forgetfulness or from a natural inability to perceive variations in the light. This is a serious fault which needs careful study to overcome, but one whose elimination will remove three-fourths of the difficulties in producing good work. With correct exposure, development becomes a simple task, and the necessity for a number of special printing papers to compensate for bad negatives is almost entirely eliminated. Our predecessors had the advantage of us in this respect; if a wet collodion negative was unsatisfactory, another was taken immediately. For bad negatives were useless for albumen prints; now they are cherished and coaxed with "vigorous" or "normal" or "soft" papers into giving a result of some sort.

Printing is not studied as it should be. The tendency is to give a full exposure to bromide papers and to trust to short development to give the desired result. This is a lazy way of working, which results in poor, rusty-black prints, and sickly yellow-toned ones. Negatives should be carefully classified according to densities, and a correct exposure given, that is to say, one which allows of full development. Incorrect exposure falsifies the scale of tones as it exists in the negative and is unjust to the operator.

There is a mischievous doctrine that certain classes of negative are required for different printing processes, and this has been the cause of much poor work. Because a passable print can be obtained from a thin negative upon bromide paper it does not follow that thin negatives give the best results in this medium, nor that because a rather hard negative will yield a good carbon that all negatives for carbon printing should be hard. What may be called a good negative is one which can be printed successfully by any process, and a good test for this is a printing-out paper, either collodion or gelatine, which does not allow of "faking" in exposure or development.

Economy is laudable, but it is not economy to send out inferior prints, if it be felt that better prints could possibly be produced. It was once a general custom for the proprietor of a studio to go through each day's prints and to destroy such as he thought unworthy of his reputation, and it would be well if this custom were still observed. Even in a single-handed studio the owner should be a severe critic of his own work, and not be content that it will be accepted without protest by the customer. If prints are only just good enough to pass muster, they are certainly not good enough to serve as an efficient advertisement of his work, and it should always be kept in mind that every print sent out is a potential advertisement for a business.

Our criticisms are not directed at any particular grade of work, as they apply to all. The budding artist who opens in the West End must not think that his artistic capabilities will atone for careless manipulation, and the most modest postcard worker will find his reward in doing better work than his rivals. To the latter class we would especially point out that his customers appreciate technique rather than art, and that a well-focussed, properly-exposed portrait will score every time. Once a proper method of working is attained, it costs no more trouble to make good photographs than it is to make poor ones, and the financial results of good work should be a stimulant to take the necessary steps to produce them.

AN EFFECTIVE APERTURE METER.

The importance of a correct valuation of effective aperture when estimating exposure will no doubt be sufficient excuse for describing a handy apertometer devised, and found very useful, by the writer.

It is believed to possess the following advantages over previous appliances: that nothing requires to be fixed or held on the lens, centring is unnecessary, the eye does not need to be shifted between the two sightings, and measuring is dispensed with, the readings being shown automatically on a scale. In addition, the eye is directed horizontally, instead of having to be pointed downwards, which latter is found difficult by many people.

The distinctive feature of the apparatus is a right-angle prism (fig. 1), having a fine black line ruled across the middle

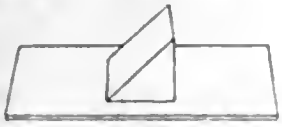


Fig. 2.

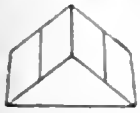


Fig. 1.

of both its 1-in. square faces. The long or hypotenuse side must not be silvered, neither should any part be covered. To receive the prism a panel is cut 4 in. by 1¼ in., and in the centre is made an aperture 1 in. square. The prism is glued in the opening as shown in fig. 2, one square side being flush with the bottom of the panel.

A stage is next needed, 5 in. by 2½ in., as shown at A in fig. 3. In it, ¼ in. from one side, is cut an aperture B, 2¼ in. by 11/16 in. At either side of the stage are glued grooved rails C and D, ¼ in. wide, for the prism panel to slide in.

Next there is wanted a millimetre scale E, 5/16 in. wide, to include 6 c.m. of graduations. This may be drawn very carefully by hand on smooth white paper, though a printed scale would be better if available. Note that the figures must be reversed, as shown in the illustration, since they will be viewed by reflection. The scale is glued by the side of the opening B.

The grooved stage needs to be mounted on a support, as seen in the perspective view of the complete apparatus (fig. 4).

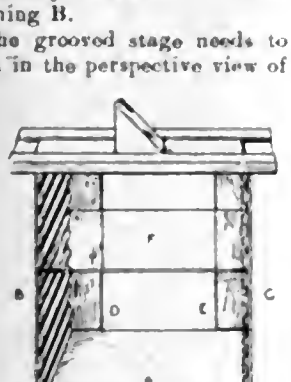


Fig. 4.

Fig. 5.

This consists of a base A covered inside with white paper to reflect light through the lens, two slightly tapering sides B and C, and a couple of narrow strengthening pieces D and E. The sides are covered inside with corrugated cardboard, to receive a piece of plain glass F which holds the lens, and to permit its adjustment to any desired height. The sides are 4½ in. high, 3 in. wide at the bottom, and 2½ in. wide at the top. The base is 3¾ in. by 3 in., while the strengthening pieces are 1 in. wide. Fig. 5 is a side elevation. The writer's apparatus is made entirely of stout strawboard, fixed with glue and bound at the edges with strips of brown paper, but thin wood would certainly be preferable.

To use the apparatus it is stood on a box so as to bring the prism level with the observer's eye. The piece of glass is adjusted to such a height as will bring the lens near the opening in the top, and the lens is stood upright on the glass. On looking in the prism two horizontal lines will be seen, as well as the reflected image of a portion of the scale. The observer has now to adjust his eye until the two lines coincide, so that one alone is visible. This is very easy, since they appear only about ½ in. distant. The prism panel is then gently pushed to or fro till the line just touches the upper edge of the diaphragm opening, as seen in Fig. 6, and the reading is noted where the line lies across the scale. In the illustration the reading is 32 mm. It is then only necessary to push the prism panel gently along, taking care not to shake the apparatus and thereby perhaps shift the lens, till the line just touches the lower edge of the diaphragm opening. While this is being done the lens and the scale appear to move upwards in the prism, in a direction perpendicular to the sighting line. The second reading is now noted, and on subtracting the first reading from it the remainder is the diameter

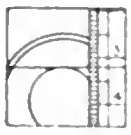


Fig. 6

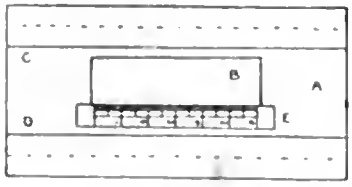


Fig. 3.

of the effective aperture. Thus, suppose the second reading to be 48 mm., the effective aperture is 48−32=16 mm. in diameter. By dividing this into the focal length the // number is obtained.

In some cases it is practicable to get the top edge of the diaphragm to coincide with zero on the scale, when the second reading obviously gives the effective aperture without calculation.

The apparatus will accommodate lenses with hoods up to 2½ in. in diameter, and of a length up to 3 in., but, of course, it can be made to any desired size, and with a longer scale. Although some may like to use a larger prism, it should be pointed out that there is no necessity whatever for the whole aperture to be visible. To simplify the diagrams only millimetre divisions are shown, but half-millimetre divisions are preferable. It is then quite easy to take readings accurately to within 0·25 mm.

Reference is made below to useful articles dealing with the subject, the first especially containing a valuable summary of essential facts and figures not to be found elsewhere in a form so comprehensive, yet comprehensible.

A. Lockett.

Bibliography. "The Speed of a Lens," by George E. Brown ("B.J.," 1921, pp. 550 and 580). "An Instrument for Direct and Rapid Measurement of F. Number," by C. Welborne Piper ("B.J.," 1917, p. 272); and Lecture at Croydon Camera Club. "Some Factors Concerning the Rapidity of a Lens," by Vivian Jobling and E. A. Salt ("B.J.," 1922, pp. 93 and 108).

A Musical Evening with Dancing was held on March 29 by the staff of Messrs. Griffin's, Kingsway, at which some 120 members and their friends congregated. Every one of the 24 items on the excellently arranged programme was thoroughly enjoyed, and much merriment was made over the "Fortex One-Step." A "Nectona Fox Trot," carried out as it was under suitable lighting conditions, proved a delightful experience. Credit for the success of the evening must be given to the organising committee, Messrs. A. Blackburn, W. Colls, H. Lindsay, and the Misses M. Neve and M. Purkiss.

PLATE SPEED NUMBERS.

In a recent number of *La Revue Française de Photographie*, M. L. P. Clerc has sought to perform the useful yet very difficult task of expressing the relations which exist between the different systems of rating the speeds of dry-plates. He does not minimise the difficulty of finding formulæ which, for example, will tell one what is the Watkins number corresponding with a rating of the plate according to Hurter & Driffield, or the German Scheiner, or Austrian Eder-Hecht systems. Nevertheless, he has worked out a series of formulæ and a table which provides at any rate an approximate comparison between the five systems of rating plates for speed which are currently employed. It is to be remarked that the German and Austrian systems are based on the measure of the smallest quantity of light which produces an image on the emulsion after development under certain prescribed conditions; whilst the English systems are based on the determination of the quantities of light yielding opacities in proportion to the illumination. Thus the former systems correspond with the region of under-exposure and are therefore sometimes termed "threshold" values, whilst the latter are representative of the period of correct exposure. Thus, strictly speaking, it is not possible to establish an accurate equivalence of the two systems, but only to determine empirically from numerous comparisons the average which corresponds to these different types of measure. Formulæ for expressing the measures, according to one system, in terms of each other, is, however, much less difficult.

If, for example, the symbols a, b and c be chosen to represent respectively the speed numbers according to H. & D., Watkins and Wynne, the formulæ expressing these values in terms of each other will be as follows:—

$$a = 0.68\,b \qquad b = 1.47\,a$$
$$a = c^2/60 \qquad c = 7.75\,\sqrt{a}$$
$$b = c^2/41 \qquad c = 6.4\,\sqrt{b}$$

If, on the other hand, we represent by d and e the numbers applying to the same emulsion according to the Scheiner and Eder-Hecht systems, the formulæ for conversion of these latter from one to another will be

$$d = 0.4\,e - 16 \qquad e = 2.5d + 40$$

By representing by the numbers 1 to 100 the relative degrees of sensitiveness of emulsions corresponding with degrees Scheiner from 1 to 20 the relative sensitiveness of an emulsion rated according to any one of the five systems may be computed by the following formulæ:

$$S = 0.139a \qquad S = 0.094b \qquad S = c^2/435$$
$$S = 1.275^{d-1} \qquad S = 1.1^{\,e}/62$$

These formulæ are much too complicated for practical use, and therefore M. Clerc has drawn up a table showing the comparative value of speed numbers according to the different systems.

Degrees Scheiner.	Degrees Eder-Hecht.	Hurter & Driffield (H. & D.)	Watkins.	Wynne.	Relative speed S.
1	42	7	11	21	1
2	46	9	13	24	1.27
3	48	12	17	27	1.62
4	50	15	22	30	2.07
5	53	19	28	34	2.64
6	56	24	36	38	3.36
7	58	31	45	43	4.28
8	61	40	58	49	5.45
9	64	50	74	55	6.95
10	66	64	94	63	8.86
11	68	82	122	71	11.3
12	71	104	153	79	14.4
13	74	133	196	90	18.3
14	77	170	250	101	23.4
15	80	216	317	114	29.8
16	82	276	405	129	37.9
17	84	351	515	145	48.3
18	86	448	660	165	61.6
19	88	570	840	186	78.5
20	90	727	1065	209	100

It is to be noted that the speed numbers according to the Wynne system differ so slightly from those used in the Cannevel or Michelin exposure meters that for practical purposes they may be considered identical.

THE PROBLEM OF THE MODEL.

THE passing of the Royal Academy's Sending-in-Day during the latter part of the month of March means a greater freedom (freedom sounds better than unemployment) for the orthodox artists' model, and advertisements offering her services to photographers may be expected in the Press.

The status of the model has improved wonderfully during recent years, and few people look askance when her calling is spoken of to-day. Twenty years ago, however, things were different. A generation ago none but the art journals—and they but rarely—would accept an advertisement of or for a model, but to-day the model finds a place for her announcements not only in the general Press, but even in the columns of the more austere and matter-of-fact "B.J."!

It is often stated in art circles that no good model need advertise, and that no good model can be secured through an advertisement; the subject is one of great controversy. The best, most serviceable and profitable model I ever had was obtained by answering her advertisement in a London evening newspaper, while the worst and most unprofitable one was secured in precisely the same way. The former was a "peach," and once figured largely on showcards and in lens catalogues, while the latter model—the unprofitable one—drew from me fees for a series of six sittings before I could expose a plate, and was never seen by me again. There are models and models.

Many photographers seek their models in Thespian realms, and after pantomime time keep a sharp look-out for those girls who, thanks to King Pantomime, have tasted of the delights of theatrical life and then take a long "rest," most of the younger models getting their first—and often their last—experience of the boards in a pantomime. But I have never been successful with models from stageland. The late H. P. Robinson tried them and found them wanting, as many others since his time have done.

Other photographers there are who have been known to wander alone or with an artist friend in Bohemia—or what is thought to be Bohemia—in search of models, but with little or no success. The cafés and like places within the quarter-mile radius of Piccadilly Circus teem with slouch-hatted, big-tied, unshaven young men who cannot paint but will, or who can paint but won't, and around may be found damsels, bobbed, deadly pale, and with slit-like eyes, but they are not models for the photographer. They might have served as such earlier in life before they themselves started painting and decorating, but in their present condition they are best left to the young painters whose canvases are not so cruel to Nature—or what is made to pass as such—as the photographer's lens and plate. Neither the land of theatres nor cafés and restaurants where artists most do congregate supply the ideal model for the camera.

To-day, I live near one of the largest jam factories, also one of the largest laundries, in London, and were I in need of a good photographic model to-day it would be among the crowd of workers in the two establishments that I would look for her, and, what is more, find her. I refer, of course, to the head or face, and not figure models; the latter are of a class by themselves, and I do not propose to deal with them in the present note. But this much may be said; if the artist's oft-quoted axiom, "The uglier the face the more perfect the figure," be true, it would not be among the factory girls that I would find a good supply of figure models. Rather would I extend by researches in the direction of London's policewomen, for among them I fancy an ideal figure could be found.

But supposing we have the opportunity of photographing a good professional camera model? What of it? Great care and caution are to be exercised. If a girl poses for several photographers, as she will do if alive to her business, you must be prepared to find that her face is rather common, and the better known her face is to the public the less value will your pictures of her be. You cannot, of course, expect her to sit to you alone, unless you pay her an exorbitant fee, and it would hardly be profitable for you to do so. I have in my possession to-day a large number of negatives of a once-beautiful model that have never been printed, and they will remain unprinted for some time, for after leaving my studio she visited a rival firm who flooded the market with her pictures before I could do so. This is one of the drawbacks of engaging and making studies of a well-known professional model, one to be prepared for, and, if possible, guarded against. The

obvious remedy against "dead stock" is to get your results in your window and showcases, or to lens, plate, and paper makers as required, at the earliest moment. Even hours are of account, for if a model gives you a sitting in the morning, she may be booked to attend a rival establishment in the afternoon.

Happily for the photographer the average model is a good conversationalist, and if you express doubts as to her qualifications she will very soon give you a list of photographers who have employed her. Her eagerness to support her claims is really her undoing, for the greater the number of her temporary employers the less likely are studies of her to be of any real value to you. It is the model who has sat to artists of the brush, but to few or no photographers, that is likely to be the most profitable and serviceable. Here and there may be found a good model as close as the proverbial oyster in the matter of talking; the majority, however, will not only boast of the many sittings given to photographers, but will suggest and take up poses given them by other camera men. When a model is so unwise and short-sighted to do this, you can rest assured that any "original" poses you think out will be described and demonstrated in detail to another worker later on.

L. T. W.

Exhibitions.

DR. HENRY B. GOODWIN'S PORTRAITS

The Royal Photographic Society has opened an exhibition of portraiture by Dr. Goodwin, of Stockholm. His work, however, is quite well-known in England, for he is an energetic supporter of the London Salon. To judge of his capability by the occasional works he sends to Pall Mall is, nevertheless, to fail to get anything like a true view. It is a case where the *ex pede Herculem*, principle will not work. You can't judge of this Hercules by his foot.

The complete man as displayed at Russell Square is a man of considerable psychological power and ample versatility. His men and women are strong in personality, and whether he gives you a dancer or a mathematician he makes you interested in the sitter for the sitter's sake. This does not imply that his work is richer in content than it is fine in form. By no means. Dr. Goodwin is obviously as often struck and inspired by the aesthetic suggestions of a subject as by the human interest in its sitter. No. 48, for example, "Gala Fair Dancer," is a composition in an oval of which the lines of the arms and legs of the seated figure are as they are for design's sake. Again, the magnificent sweep of the lines in No. 50, a fine head and bust, are of more importance than the mere portraiture of another dancer, "Jenny Hasselqvist." With a keen sense of style Dr. Goodwin shows four portraits of this lady all utterly different in conception. No. 51 is not in a dramatic, but a quiet mood, and the treatment here takes the cue from the regular oval of the face, for all the lines have the clean, smooth compactness of the elliptical curve. Many figure studies are arranged with severe symmetry.

Perhaps the most remarkable efforts pictorially are a set of studies of a damsel who possesses hair having the quality of hanging together in curly strands. This figure, taken at half length or less, and usually nude, has produced a series of designs that remind one of the flat and archaic paintings of the early Renaissance; and Dr. Goodwin's lighting and treatment heighten the similarity. No. 62, with its flatness and edginess, and the long, curly locks, might be taken for a photograph of a Botticelli. Yet Dr. Goodwin assures me that no such idea or any attempt at archaism has ever entered his head. This shows how unsafe it is for people to accuse photographers of imitating paintings. The imitation arises unaided and unsought for, in most cases. Strangely enough, Nos. 60 and 61 of this series are very modern in feeling.

Another characteristic of this exhibition is a statuesqueness in several portraits of ladies with bare arms. It is rare to find so many classically beautiful arms in one show; they are so full and round that they look like those of marble statues. In No. 55, "Mrs. Karl Asplund," Dr. Goodwin has adopted a grey smoothness of treatment that even in the drapery gives a classic association of ideas. It is, to my mind, a fitting and very pleasing style for a pose so beautifully simple and of such real Greek spirit. The visitor will find other statuesque effects.

But the clothed and everyday sitter fares just as fortunately in Dr. Goodwin's hands. "Ira B. Goodwin" (40) is a splendid example of his rich, dark manner. "His Excellency Count Herman Wrangel" (5) is another excellent work, full of careful artistry, well planned, and with a tonal scheme like an old master.

The exhibition closes on Wednesday, the 19th inst., so there is not too much time to waste before seeing a show that is solidly and thoroughly good. Failure to see it will be regretted.

F. C. Tilney.

FORTHCOMING EXHIBITIONS

March 27 to April 8.—Dennistoun Amateur Photographic Association. Particulars from the Exhibition Secretary, Colin Graham, 448, Duke Street, Dennistoun, Glasgow.

April 4 to 19.—Royal Photographic Society. Prints by Dr. H. B. Goodwin. Open daily from 11 a.m. to 5 p.m. 35, Russell Square, London, W.C.2.

April 5 to 8.—Leicester and Leicestershire Photographic Society. Particulars from the Hon. Secretary, W. Bailey, Cank Street, Leicester.

April 5 to 8.—Faversham Institute Photographic Society. Particulars from the Hon. Secretary, W. H. Evernden, 116, West Street, Faversham.

April 21 to May 11.—Hammersmith Hampshire House Photographic Society. Particulars from the Hon. Exhibition Secretary, J. Anger Hall, 26, Bishop's Mansions, Bishop's Park Road, London, S.W.6.

April 22 to May 27.—Royal Photographic Society. Colonial prints arranged by "The Amateur Photographer and Photography."

May 1 to 6.—Photographic Fair. Horticultural Hall, Westminster. Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1.

June 1 to 30.—Royal Photographic Society. Prints by Pirie MacDonald, of New York.

September 9 to October 7.—London Salon of Photography. Latest date for entries, August 30. Particulars from the Hon. Secretary, London Salon of Photography, 5a, Pall Mall East, London, S.W.1.

September 11 to 15.—Professional Photographers' Association, Princes Galleries, Piccadilly, London, W. (Trade and Professional). Hon. Secretary, Richard N. Speaight, 157, New Bond Street, London, W.1. Also foreign invitation loan exhibition of professional portraiture. Hon. Secretary, Marcus Adams, 43, Dover Street, London, W.1.

September 18 to October 28.—Royal Photographic Society. Latest date for entries, August 25. Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

Patent News.

Process patents: applications and specifications—are treated in "Photo Mechanical Notes."

Applications Mar. 13 to 18:—

Films.—No. 7,625. Developing, etc., photographic films. P. L. Burger.

Applications, March 20 to 25:—

Flashlight.—No. 8,362. Flashlight pistols and apparatus for photography or signalling. W. S. Crapper.

Mounting.—No. 8,436. Mounting of photographs. T. H. M. Green.

Print Drying Apparatus.—No. 8,057. Apparatus for drying photographic prints, etc. Kodak, Ltd.

Colour Cinematography.—No. 8,584. Method of producing cinematographic projections in natural colours. W. Spath.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

Colour Screen Plate Processes.—No. 175,373. (November 10, 1920). The method of producing a positive transparency in

natural colours, which consists in making a negative of a subject on a sensitive photographic support having a permanent colour screen of different coloured elements, making a monochrome positive from this screen negative on a surface coated with a panchromatic emulsion, and mounting the monochrome positive in registered position with a colour screen identical with or a copy of the screen through which the negative was taken. Florence Maude Warner, Hotel Pennsylvania, 7th Avenue, and 34th Street, Borough of Manhattan, City, County and State of New York, United States of America. The details of the specification are given on another page in the "Colour Photography" Supplement.

THREE-COLOUR PRINTS. No. 175,003 (October 30, 1920).—The invention consists in a process of making three-colour prints in which two chemically toned images and one pigment or dye image are superimposed. According to one form of the process, the pigment image may be provided by a magenta carbon print (which may be modified by flavazine or naphthol yellow or a mixture of the two). The blue-green and yellow impressions may be produced respectively by iron-ferricyanide and mercury-iodide-ferricyanide toning.—John Frederick Shepherd, 10, Derwentwater Road, Acton, London, W., and Colour Photography, Ltd., 3, St. James Street, London, S.W.1. Further particulars of the process are given on another page in the "Colour Photography" Supplement.

STOPS FOR STEREOSCOPIC OR RELIEF EFFECTS.—No. 175,466 (December 6, 1920). The invention comprises a construction of lens stop in which a central aperture is used surrounded by two or more apertures, the apertures collectively producing with a lens a double viewpoint or stereoscopic effect, the characteristics of

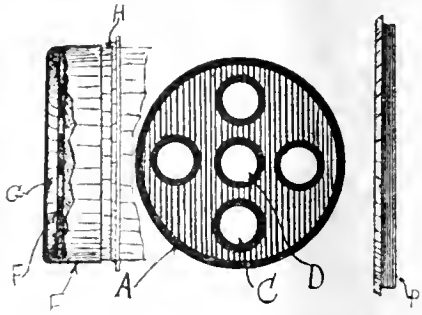


Fig. 5 Fig. 1. Fig. 2.

which are similar to those seen in photographs taken with a stereoscopic camera when viewed through a stereoscope.

The stop may be applied to lenses for taking stereoscopic photographs, also to lenses used for projecting photographs on to a screen.

Improved stereoscopic or relief effects are produced by the application to the front part of a lens, or again, by the application to the back part of a lens, of a stop having a central aperture as at D with two or more apertures C surrounding this central aperture D as illustrated in figs. 1 and 4.

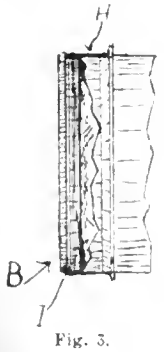


Fig. 3.

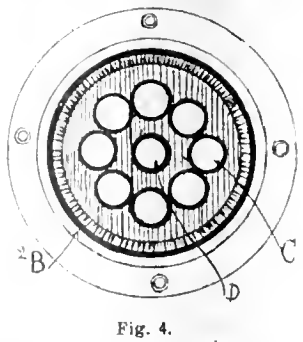


Fig. 4.

The apertures are arranged so that they come within the circle, A, fig 1, of the lens surface.

The apertures may be circular or otherwise in shape varying in size and number to meet the varied requirements of the photographer.

The feature of the invention lies in the provision of a central aperture with two or more apertures surrounding this central aperture. Fig. 1 shows a stop with four apertures surrounding a central aperture. Fig. 4 shows the front elevation of a lens with a stop in position having a central aperture with eight apertures surrounding this central aperture. Fig. 2 illustrates one convenient form of holding the stop in position, it is the side elevation of a flange B 1, provided with a screw to screw into the front or back portion of a lens mount. In fig. 3, B shows the same in position within the lens mount H, immediately in front of a lens I. Fig. 4 illustrates a front elevation of the same lens with the flange and stop in position for taking a photograph.

Fig. 5 illustrates another method of applying the invention, comprising a slip-on or socket arrangement E. This is made to slip over the lens mount H, and is provided with a lip G, that presses against the stop F, holding same in position within the lens mount H.—Thomas Henry Pemberton, 35, Leigh Street, Burslem, Stoke-on-Trent.

The following complete specifications are open to public inspection before acceptance:—

FILM STRIPS.—No. 176,759. Apparatus for use in the treatment of strips of photographic film. F. J. M. Hansen.

COLOUR PRINTS.—No. 176,777. Apparatus for the reproduction on paper of Autochrome and other plates in their proper colours. E. Bueno.

CINEMATOGRAPHY.—No. 176,780. Projection of moving pictures. Bardy Motion Picture Machine Co.

SOUND PHOTOGRAPHS.—No. 176,796. System for the conversion of sound waves into light variations to be photographically recorded on sensitive films. I. H. Hakken.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

ARISTAR.—No. 421,982. Sensitised plates, sensitised films and chemical substances used in photography. Bloom's, Ltd., 7, Ridgmount Street, London, W.C.1, opticians and photographic dealers. January 3, 1922.

ARISTAR.—No. 421,983. Cameras, lenses and measures used in photography. Bloom's, Ltd., 7, Ridgmount Street, London, W.C.1; opticians and photographic dealers. January 3, 1922.

ANAPLAS REPRODUCTIONS.—No. 421,790. Etchings, photogravures, reproductions of oil and water-colour paintings, photographs and drawings. Cecil Philippson, 29, Mincing Lane, London, E.C.3. general merchant. December 23, 1921.

MARKS PLACED ON THE REGISTER.

The following marks have been placed on the register :—

D 50 (HEXAGON NUT DEVICE).—No. 409,867. A photographic developer. Chemicals and By-Products, Ltd., Rickmansworth Road, Watford, manufacturing and consulting chemists.

IMPEX.—No. 411,021. Photographic sensitised paper. The Imperial Dry Plate Co., Ltd., Ashford Road, Cricklewood, London, N.W.2, manufacturers of photographic materials.

DESENSITOL.—No. 411,785. Chemical substances used in photography, photographic plates and photographic films. Ilford, Ltd., Britannia Works, Roden Street, Ilford, Essex, manufacturers of photographic plates, paper and films.

PROXAR.—No. 362,972. Optical instruments. The firm trading as Carl Zeiss, 2, Carl Zeiss Strasse, Jena, Germany, manufacturers of optical and philosophical instruments.

UNIVERSUM.—No. 382,665. Sensitised films for photography. Universum-Film Aktiengesellschaft, Unter den Linden, 56, Berlin, Germany, manufacturers.

FAERIE CINEMA.—No. 409,603. Photographs. William Rampling Rose, 22, Bridge Street Row, Chester, Cheshire, manufacturer.

AYNONA.—No. 412,797. Photographic papers. John Aeron-Thomas, Dolgoy, West Cross, Glamorgan, manufacturer.

PASTINELLO.—No. 413,292. Projection screens for motion picture theatres and for other optical projection apparatus. The firm trading as Bardilis, 73, Great Titchfield Street, London, W.1, manufacturers.

KINATOME.—No. 413,806. Cinematograph projection apparatus. Herbert George Ponting, 47, Oxford Mansions, Oxford Circus, London, W.1, company director.

New Books.

Blue Printing and Modern Plan Copying. By B. J. Hall, M.I. Mech. E. London: Sir Isaac Pitman and Sons. Ltd. 6s. net.

As a large maker and user of iron printing papers and of apparatus for their employment, Mr. Hall is exceptionally well qualified to write for the information of engineers, architects, contractors and others, having occasion to carry out the multiplication of plans and drawings by the processes which are commonly known as "blue printing." He does not deal with the preparation of these papers, but with their use, and, as regards the latter, confines himself to the three papers now commonly employed, namely, ferro-prussiate, ferro-gallic and sepia, with the addition of the process which has gained greatly in importance of late years and is most generally known as the "true-to-scale." In the chapter on the comparative costs of these methods of reproduction there is a valuable table showing the variation in relative cost, according to the number of copies from a single tracing. Thus, if one copy only is wanted ferro-prussiate paper is about one-third the cost of true-to-scale, whilst if twenty prints are needed the cost per print by ferro-prussiate is roughly one-third more than by true-to-scale. Apparatus forms the largest and most important part of the book, and the author fully describes the equipment for printing by daylight and electric light, including the modern machines for continuous copying. Of late years machines for washing and drying have come into use on a no less considerable scale than those for electric printing, and have made possible the production of immense batches of prints within a working space which would have been altogether inadequate under the old conditions of flat baths and atmospheric drying. The true-to-scale process is the subject of several chapters in which the technique of this process is very fully the subject of instruction. We know of no other manual or publication in which the manipulation of the jelly surface to which the image of a blue print is transferred is so fully and practically considered. The use and merits of the Photostat daylight copying camera are also included within the scope of the manual. Throughout, the author writes as an engineer intimately familiar with the methods and machines with which he deals, and the manual can certainly take its place as a most reliable and complete instruction volume in the important branch of work of preparing "photo-copies" of industrial and commercial drawings and documents.

Kinematograph Studio Technique.—This little volume, published in the series of the "Technical Primers" of Sir Isaac Pitman and Sons, Ltd., provides a rapid review of the methods which are employed in the production of drama cinema films. After a brief description of studios and their methods of illumination, the author, Mr. L. C. Macbean, explains the system which is followed in arranging stage settings and backgrounds in accordance with the scenario of a piece. In this portion there are some definitions of terms used by scenario writers which will be of service to those with aspirations in this field of dramatic creation. Then follow some notes on costumes and make-up and on the choice of outdoor scenes. Stage management of a scene which is in preparation for recording by the camera and the methods of producing the effects of dissolving, fading, etc., which are conventions of the cinema performance are the subject of a further chapter; and the volume concludes with notes on development of negative and positive films and on the electric equipment of a studio. Plainly within such a small compass it is not possible to do more than describe in the briefest outline the methods which are employed. Nevertheless the author has contrived to bring a good many items from his own practical experience into the pages of the book. The price is 2s. 6d. net.

Royal Institution.—Lectures at the Royal Institution after Easter will be resumed on Tuesday, April 25. On Thursday afternoons there will be two lectures by Prof. E. H. Barton on "Audition and Colour Vision." On Saturday afternoons there will be two lectures by Prof. C. W. Richardson on "The Disappearing Gap between the X-ray and Ultra-Violet Spectra."

New Materials.

Embossed Seals and Labels.—Mr. F. C. Clarkson, 57, Charminster Road, Bournemouth, sends us samples of the embossed seals and labels produced in a great variety of shapes, designs and colours for attachment to photographers' mounts and other stationery. These stickers are supplied in lots of 5,000 and upwards at prices which, in popular sizes, average 5s. 6d. per thousand for 5,000 lots; 4s. 6d. per thousand for 10,000.

Gramme Self-Ortho Plates.—Messrs. Griffins, Kemble Street, Kingsway, London, W.C.2, send us samples of this new plate of the self-screen class, which readily yields negatives of good vigour with quite a considerable degree of orthochromatic correction without the use of a light filter. Probably a plate of this kind is now the most popular choice of the more informed amateurs, to whom an addition to the brands among which they may make choice will be welcome.

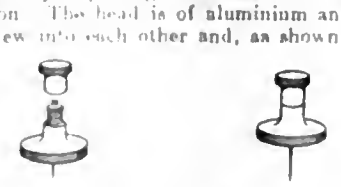
Cream Tone Noctona Gaslight Paper.—Messrs. Griffins have added a new grade to the varieties of their popular gaslight paper of this name. It is of an agreeable pale buff tint and smooth surface, that is to say, without gloss, and equally without definite matt effect. The paper is handled exactly in the same way as the other grades of "Noctona," and, like them, exhibits an excellent latitude in the results from different classes of negative, yielding prints of rich black colour and freedom from stain.

Griesbaber Plates and Papers.—Samples of the whole range of products manufactured by the old-established Paris dry-plate firm of Griesbaber Frères et Cie are sent to us by the wholesale agents for the United Kingdom, the Anglo-French Photography Co., 46, New Kent Road, London, S.E.1. Messrs. Griesbaber have a very full range of dry-plates, from their Blue Label of speed 20 H. & D. to their Special Portrait for half-watt lamps of 500 H. & D. In the case of almost all the plates rated at 200 H. & D. and higher, each speed is made in three varieties—an ordinary, an orthochromatic and an anti-halation. The firm also makes special orthochromatic plates, an anti-screen plate, the Integrun, for use without a light-filter, in addition to a panchromatic. Transparency or lantern plates and also X-ray plates are included among its products. All these plates are supplied in a large number of English sizes, from 2 ½ x 1¾ to 24 x 20. They are, of course, also made and listed in the Continental centimetre sizes.

Printing papers are represented by a similarly wide range. Bromide paper is made in three grades of contrast, normal, soft and special contrasty for thin negatives, in each case in glossy, semi-matt and smooth matt surfaces. These same surfaces are obtainable in a special grade of bromide paper, issued as "Dora," giving warm black or brown tones by direct development, according to the degree of exposure. Ordinary P.O.P. and "Automatic" (self-toning) paper are also among their manufactures, all of these papers being issued in postcards of the regulation 5½ x 3½ size. A detailed 8-page price list is obtainable on application from the Anglo-French Photography Co.

New Apparatus.

Penrose Push Pins.—Messrs. A. W. Penrose & Co., Ltd., 109 Farringdon Road, London, E.C.1, kindly send us one of the new push pins which they are just placing on the market. The pin is of quite novel construction. The head is of aluminium and is made in two parts, which screw into each other and, as shown in the drawings,



allow of almost any ordinary pin being inserted. As supplied, the pin proper is of stout gauge and non-rustable surface, so that there is no reason to think that renewals will be frequently required. Nevertheless, it is certainly an advantage to be able to use the metal heads indefinitely. The complete pins are supplied at the price of 3s. per dozen, or 30s. per gross.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SUNDAY, APRIL 9.

United Stereoscopic Society. "Picturesque Devon." J. A. Hodges. And 1919 Competition Slides.

MONDAY, APRIL 10.

City of London and Cripplegate P.S. "Work on the Negative." B. C. Wickison, F.R.P.S.
Southampton Camera Club. "Pictures Without Words."
South London Phot. Soc. Annual General Meeting.
Walthamstow P.S. "Simple Control in Enlarging" and "Mounting." W. H. Reece.

TUESDAY, APRIL 11.

R.P.S. "Photographic Portraiture, Pure and Simple." Dr. H. B. Goodwin, F.R.P.S.
Belfast C.P.A. Camera Club. "Demonstration of Carbro Process." O. D. Walton.
Bournemouth C.C. Beginners' Instructional Evening. J. Thomas.
Cambridge Photo. Club. "A.P. and P." Prize Slides.
Exeter Camera Club. "Car-Bro." A. Dordan Pyke.
Hackney Phot. Soc. Annual Sale.
South Shields P.S. House Exhibition of Members' Prints.
Stalybridge P.S. "Seltona Lecture and Demonstration."

WEDNESDAY, APRIL 12.

Borough Polytechnic P.S. "How a Reflex Camera is Made." Messrs. Butcher.
Croydon C.C. "Colour Vision." F. C. Reynolds.
Forest Hill and Sydenham P.S. "Panchromatism and Colour Filters." H. G. Fleck.
Ilford Phot. Soc. "Hints, Dodges and Gadgets."
Partick Camera Club. Members' Lecturette Night.
Photo-micrographic Society. "The Mycetozoa." A. E. Hilton.
Rochdale Amateur P.S. Beginners' Troubles.

THURSDAY, APRIL 13.

Gateshead Camera Club. Members' Night.
Hammersmith Hampshire House P.S. "In a fair ground, yea, Sussex by the Sea." J. Grice.
Optical Society. Ordinary Meeting.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, April 4, the president, Mr. W. L. F. Wastell, in the chair.

Mr. Herbert Lambert delivered a lecture entitled "Imaginative Portraiture." He began by illustrating the distinction between imaginative and merely reproductive work by instancing Wordsworth's poem of the old leech gatherer, a thing of art made from material which in the hands of, say, a newspaper reporter would have been something utterly commonplace. When he proceeded to turn from the art of writing to those of the painter and the photographer, he was, perhaps, less explicit in defining the qualities which resulted from the exercise of the imaginative faculty. In fact, he confessed that while it was easy to describe what those results should not be it was exceedingly difficult to put into words what they should be. Mr. Lambert resorted to illustration and showed a number of examples of photographic portraiture which in his judgment exhibited the quality of imagination. These included work of Craig Annan, A. L. Coburn, Marcus Adams, Malcolm Arbuthnot, Walter Benington, Frederick Hollyer and one or two of his own. If he did define the quality common to these works, it was by saying that the imaginative work created in the observer's mind an impression of the moral, human, and intellectual personality of the sitter, as distinguished from his mere facial characteristics. Mr. Lambert had some interesting things to say on the function of lighting in bringing out this rendering of character. He emphasised the important part which it played, and strongly expressed his view that the rules of conventional lighting (the angle of 45 deg.) could often be broken with advantage. On the other hand, he severely condemned the mere tricks of complex lighting done simply with the object of introducing accents and splashes of light in the composition without relation to the study of the face. He called this simply "playing about with lights." It was a bad thing unless it was done with a clear motive, namely, that of contributing to the photographer's aim in making a character study.

The papers aroused a somewhat animated discussion in which were joined Messrs. C. P. Crowther, W. Thomas, Marcus Adams, Furley Lewis, George Hawkings and Dr. H. B. Goodwin. The latter is to lecture next week on "Photographic Portaiture, Pure and Simple," and in his contribution to last Tuesday's discussion gave evidence of the vigorous and explicit expression of his views which may be then expected.

On the proposition of the chairman, a very hearty vote of thanks was accorded to Mr. Lambert.

CROYDON CAMERA CLUB.

Mr. E. Human, of the "City Sale & Exchange," Sloane Square branch, read an interesting paper on "The Possibilities of a Small Camera." Accompanying him was a basket of enormous size from which he extracted camera after camera and accessories galore.

A well-reasoned and persuasive plea was advanced for the stereoscopic camera, and the strong points of the "Verascope," and other beautifully made and scientifically designed midget plate and film stereo cameras were fully described with various stereoscopes and other apparatus. Most of the goods certainly cost good money, and appeared to be well worth the prices charged, which, he said, had recently been reduced.

Perhaps the most remarkable feature of the evening consisted of enlargements of very high magnifications from the tiny originals. They amply demonstrated the splendid defining powers of the objective fitted to the cameras.

Prior to the proceedings an informal dinner at the Greyhound Hotel took place, with Mr. A. F. Catharine as the guest of the club. Unfortunately for it he is leaving Croydon, and the club will see him but seldom. He will be badly missed.

Nevertheless, the members kept their peckers up, and the atmosphere of extreme geniality which blew in with their arrival, accompanied Mr. Human throughout the evening. An atmosphere, if not exactly conducive to true binocular vision, undoubtedly assisting in the direction of general appreciation. A most hearty vote of thanks was accorded the painstaking lecturer.

FOREST HILL AND SYDENHAM PHOTOGRAPHIC SOCIETY.—Lecturing on "Flashlight Photography," Mr. J. A. Webberley showed a flash lamp of his own design, made from an ordinary flint-wheel gas lighter, to which a grooved tray of tin had been soldered at right angles. Using 15 grains of a mixture of equal parts of saltpetre and magnesium powder, fully exposed negatives of members were obtained with an aperture of f/6. By the use of Hypono hypo-eliminator, followed by a soaking in a saturated solution of potass. carbonate (which dried the plate in a few minutes), gaslight prints were made from the negative within 25 minutes of the time of exposure, demonstrating the ease with which photographs can be quickly obtained in the absence of daylight. Holding the flash lamp well above the head was advocated as securing better lighting than at camera level, and the use of fast ortho. plates was to be preferred.

Commercial & Legal Intelligence.

AT THE LONDON BANKRUPTCY COURT, on Friday, March 31, the first meeting of creditors was held of Albert Young, trading as Fradelle & Young, 41, Museum Street, London, lately carrying on business at High Street, Notting Hill Gate, London, Technical Photographer, against whom a receiving order was made on March 16, 1922, on a creditor's petition, the act of bankruptcy being non-compliance before Feburary 3, 1922, with the banruptcy notice duly served upon him. The Official Receiver, Mr. Walter Boyle, having dealt with the proofs of debt lodged, said the debtor had not surrendered under the proceedings, and that an inspector had attended at 41, Museum Street, W.C., but did not see the debtor. On the premises there was a typewriter, photo-stand, screen, steps, large camera, screens, oak fireplace, four large alabaster electric globes, dark-room requisites, and a clock. The inspector had also attended at 37, High Street, Notting Hill, but nothing was known of the debtor there other than that he lived there some nine or twelve months ago, and there was no property, books or papers there belonging to him. A creditor present said the debtor used

to take photographs at Masonic and other banquets, and he believed at one time he was doing very well. The estate was left in the hands of the Official Receiver.

NEW COMPANIES.

Oil Portraits, Miniatures and Artcrafts, Ltd.—This private company was registered on March 30, with a capital of £1,500 in £1 shares (500 partg. preference and 1,000 ordinary). Objects: To take over the business of painters and producers of oil and other portraits and miniatures, general artists, photographers and picture-frame makers, etc., carried on at 60, Spring Bank, Hull. The first directors are: S. P. Roberts, 60, Spring Bank, Hull (managing director); H. Croasdale, 36, Walmsley Street, Spring Bank, Hull; secretary, H. Croasdale. Registered office: 60, Spring Bank, Hull.

News and Notes.

Photographic Society of Ireland.—The hon. secretary is now Mr. H. E. Webster, "Avonmore," George's Avenue, Blackrock, Dublin.

Houghton's Professional Bulletin for March contains announcements of reductions in the prices of several lines of goods, notably mounts and mounting boards, and some account of recent introductions.

Wallace Heaton Bargains.—The latest mail order price list of second-hand and other cameras issued by Messrs. Wallace Heaton, 84, High Street, Sheffield, contains particulars of a very great variety of roll-film and other cameras, lenses, enlargers and miscellaneous accessories. Sent free on application.

More Camera Smuggling.—At Dover, last Saturday, when a fine of £10 17s. for attempted smuggling was imposed on F. W. Chambers, of Dublin, it was stated that when he landed from the Ostend boat a camera was found wrapped in a shirt at the bottom of his bag.

Photographing the Sun's Eclipse.—The daily Press report the landing of 6½ tons of photographic and scientific instruments at Singapore ready for shipment to Christmas Island, from which place the eclipse of the sun is to be officially observed and photographed next September.

Thieving for Photography.—A junior clerk, aged 18, was bound over at Newcastle-on-Tyne last week for the theft of £2, which he spent on photography. Prisoner was in charge of a cash-box, and thousands of pounds had passed through his hands. His salary was £50 a year. The Bench expressed the opinion that the remuneration paid for such a responsible position was not at all adequate.

Burglars Use a Dark-room.—A cleverly planned, but only partially successful, safe robbery was carried out one night last week on the premises of Mr. D. P. Roberts, chemist, of West Croydon. The thieves got over a high wall and through a window to the shop. To avoid being seen through the unshuttered front windows, they removed two safes to the photographic dark-room at the back of the shop.

A Link with the C.D.V.—One of last Sunday's newspapers, in recording the death of the ex-Emperor Karl of Austria, states that the ex-Empress is a descendant of the Duke of Parma, who in 1857 invented the C.D.V. size of portrait. The ex-Empress was Princess Zita of Bourbon-Parma (writes a correspondent), but efforts to trace her exact relationship to the C.D.V. Duke have failed—it must be very remote.

Kodak Posters.—The large Kodak poster just issued is a delightful reproduction in colours of a work by John E. Sutcliffe, showing a red-haired Kodak girl on a bridge over a brook in a picturesque spring landscape. In addition, Messrs. Kodak, Ltd., are issuing a transfer design in colours of another variation of the Kodak girl, which can be readily fixed to the outside of a window and which carries the legend, "Life's a joy with a Kodak."

The Ensign Handbook.—The 1922 edition of this combined text-book and catalogue, issued by Messrs. Houghtons, Ltd., 88-89, High Holborn, London, W.C.1, price 6d., is a plump little volume of 250 pages. The text-book part, consisting of ten chapters by W. L. F. Wastell and Percy G. R. Wright, contains a great deal of practical information expressed in a way which those most slightly acquainted with photography can understand. The catalogue very fully describes and illustrates the many patterns of camera of Messrs. Houghtons' manufacture, and also the various accessories for development, printing and mounting, which the amateur photographer needs to include in his equipment.

A Butcher Dealers' Catalogue.—Messrs. W. Butcher & Sons, Camera House, Farringdon Avenue, London, E.C.4, have just issued an abridged 1922 catalogue, chiefly of amateur requisites. The list, despite its title, is a very full and fully-illustrated catalogue of the British-made cameras and other apparatus which are specialties of Messrs. Butcher. In particular, many of its pages are devoted to accessories, such as printing frames, tripods, finders and washers, dark-room lamps, dishes and tanks. Mounts for the amateur are also a large feature, and a final section relates to cinematograph and optical lanterns. The list is sent free to any dealer making application on his trade card.

Photographic Pitches at Bournemouth.—A reader who has been in correspondence with the Town Clerk of Bournemouth states that the photographic pitches at Bournemouth were sold only to ratepayers of the town. Last year pitches of all kinds (30) were tendered for, when only £775 was realised, but this year's auction of them brought in £2,474. Bidding for the nine photographic pitches was exceptionally keen, their positions and prices for the season being:—West Beach (4), £215 (with kiosk), £50, £40 and £32 10s.; East Beach, £180; Alum Chine, £10; east of Zig-Zag, £30; Fisherman's Walk, £10; and Boscombe Beach, £25. The highest bid (£300) was for a stall for sweets, and the next (£270) for an ice-cream pitch.

A Warning to Dealers.—Paragraphs in the lay Press state that the police are looking for a man who has made hundreds of pounds by stealing binoculars in a novel manner. He enters an optician's as a possible customer and asks to see some binoculars, the prices of the best of which range from £20 to £40. After examining several he selects one pair, which he professes to like and, saying he desires to try their range, walks to the door and holds them to his eyes scanning the street. A moment later he disappears in the throng with the glasses. Dozens of opticians have complained of his thefts, and it is estimated that he has obtained goods worth £500 during the last three months. He is described as tall, well spoken, and fashionably dressed. As we often see possible purchasers of hand-cameras testing finders and lenses at the street doors of our leading stores, dealers will perhaps take a hint, for hand-cameras may go the same way as the vanishing binoculars.

North Middlesex Photographic Society.—This old-established North London society supplies evidence of its continued vitality by issuing a year book for 1922-23, containing a list of members and past-presidents and the full syllabus of papers, instruction lectures and outings up to and including September 28 next. Few societies can point to so complete and comprehensive an announcement of their programmes, and we are sure that the issue of the year book will bring many members within the ranks of the society and greatly to their advantage if they need practical help and assistance and the opportunities for outdoor work under the guidance of those well able to help them. Those of our amateur readers who are within easy reach of the headquarters of the society, which are about equi-distant from the Stroud Green and Harringay Great Northern stations, will be well advised to communicate with the hon. secretary, Mr. W. M. Bond, 24, Henningham Road, Lordship Lane, Tottenham, N.17.

Government Orders Abroad.—In the House of Commons during last week Mr. R. Young asked the Under-Secretary of State for India if he was aware that many optical instrument makers are working short time and others are drawing State unemployment benefit; whether, in spite of these facts, the India Office has placed two orders for prism binoculars abroad; and to which foreign firms have these orders been given, and for what reasons? In reply Earl Winterton said the India Office had placed no orders recently for binoculars, but he was informed by the High Commissioner for India, who dealt with such matters under the direct control of the Government of India, that he had recently placed one order for 5,120 prismatic binoculars with the French firm of Huet & Co. through their English agents. This order was not placed until it had been ascertained that the instruments were suitable. A large financial saving was involved. 6,000 binoculars had been previously ordered from English makers.

A Great French Catalogue.—Mr. W. E. Dunmore, during the comparatively few years in which he has been established in Paris at 22, Rue Saint-Augustin, as a wholesale dealer in photographic requisites, has built up a large business, the wide scope and importance of which is reflected in the catalogue just issued by him. This is a volume of 156 large pages, fully listing and pricing the innumerable goods for which Mr. Dunmore is agent. Articles of French manufacture naturally figure largely in these pages, and the English worker, professional or amateur, will find described many pieces of apparatus which are of interest to him from their novelty. Mr. Dunmore is the agent in France of the Thornton-Pickard Co., of Messrs. Taylor, Taylor and Hobson, and the goods of these firms, as also Imperial plates, Paget papers and Akron dry-mounting tissues, for which he is also agent, figure prominently. Although the list is in French, the illustrations are so numerous that practically anyone without any knowledge of the French language can use the catalogue. Prices are also in francs, but Mr. Dunmore will always quote any given article in English currency. A copy of the list will be sent free to anyone on application.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

INVENTIONS IN COLOUR PHOTOGRAPHY.

To the Editors.

Gentlemen,—I do not intend to enter into any controversy with Mr. Ives, but as I made a statement, and he has denied the truth of the same, I merely want to put the case as I see it.

The purpose of a non-actinic dye, added to dichromated gelatine or other colloids, is avowedly for the purpose of keeping the relief low, and I have proved that this was done by du Hauron, Lumière and Pfenninger. It would seem to the technical mind that the incorporation of a pigment was immaterial. But obviously to the mind of the inventor there is a big difference; and also to that of the patent examiners. But then one can make these latter gentlemen believe almost anything, as they are, as a rule, utterly ignorant of the practice and literature of photography.

Had Mr. Ives taken the trouble to turn up one or two of the many references that I gave to the Lumière process, he would have found that the sensitive mixture recommended was composed of gelatine, Coignet's hard glue, ammonium dichromate, neutral potassium citrate, cochineal red (aniline), alcohol and water.

In my original paper, "B.J.," 1921, Col. Phot. Supp., September 30, I included Sanger Shepherd amongst those who had anticipated Mr. Ives; but as I had lent my patent files and notes, when I wrote my last letter, I did not include this, as I was loth to trust entirely to my memory. E. Sanger Shepherd and O. M. Bartlett, E.P. 24,234, 1902, state fol. 2, lines 17 to 20: "In order to keep the relief as low as possible is is desirable *to add a colouring matter*, or preferably bromide of silver to the gelatine solution, as the latter may be easily removed after printing by a solution of hypo-sulphite of sodium."

The use of the dye is not included in the corresponding D.R.P. 161,519, 1902, and U.S.P. 728,310, 1903.

Further references to this patent will be found in J. Camera Club, 1903, 18; "B.J.," 1902, Vol. 49, 913, 1,015; 1903, Vol. 50, 50; Handbuch, 1917, Vol. 4, 11, 319 Jahrbuch, 1903, 451; Phot. Woch., 1903, 28; Amat. Phot., 1903, 310.

This patent refers to the making of colourless relief images, which are subsequently stained up for the imbibition or transfer process to other receptive surfaces.

It is clear, therefore:

(1) That MM. Lumière anticipated U.S.P. 980,962 by ten years; (2) that Shepherd and Bartlett anticipated the same by eight years. And Mr. Ives states: "There cannot be found a single anticipation of my addition of a non-actinic water-soluble dye in the sensitised colloid coating, exposing said sensitive coating to light, developing the print, discharging the dye, and then subjecting the print to its appropriate dye bath."

In both the above cases a water-soluble, non-actinic dye was used, a colourless relief obtained, which was subsequently stained up in its appropriate dye bath.

With reference to White's camera, Mr. Ives says that this infringes the claims of his U.S.P. 531,040, and that my statement, that it is the same as E.P. 2,305, 1895, is not entirely true. I did not mean that the two were literatim et verbatim the same, but that the object patented was the same. I have very carefully compared the two patents, and they are in text, with minor exceptions, materially and essentially the same. In the American patent there are 11 claims, in the English seven; and the following shows the similarity: U.S.P. claims 1 and 2 are the same as E.P. 1 and 2; U. 5 is E. 3; U. 7 is E. 4; U. 8 is E. 5; U. 10 is E. 6; . 11 is E. 7.

There are thus claims 3, 4, 6, and 9 in the American, which are unaccounted for. Claim 9 is for a chromoscope having *a*, that is one, transparent mirror at an agle; claim 6 is for a chromogram; claim 4 is practically the same as E.P. 1, with the addition of means of varying the angle of the instrument in respect to the incident light; claim 3 is for a series of inclined mirrors, colour screens, and series of chromogram supports one above another.

The whole essence of the two patents is for a viewing instrument, though in the American patent there are six lines, out of a total of 442, in which the possibility of using it as a camera is outlined: "And by the use of suitable lenses and colour screens and the substitution of plate-holders for the chromogram-holders, either form of instrument may be adapted for making the chromogram negative as well as for exhibiting the chromogram." With this exception, and the title, preamble, and the first two claims, there is not the slightest suggestion of a camera. In the English patent the same passage occurs, and in the title, not the preamble, and in five claims the word "camera" is used.

Mr. Ives' statement that the White camera infringes his patent carries no weight at all. If we are to believe this, Mr. Ives must quote the actual claim and show where it is infringed.

One cannot be plaintiff, defendant and judge all at the same time.

If the statement, "obviously, my claim to the original invention of a specific type of camera is not discredited by the fact that some years after some one made one with one of the mirrors at a different angle," means that he invented this type of camera, then it is not true. Mr. Ives himself states in his U.S.P., fol. 3, lines 40 to 48, "the arrangement of images in steps and the reflection of the light passing through three images by means of transparent mirrors *is not new*, but in the only prior device with which I am familiar, the steps were perpendicular to the base of the instrument, and the transparent mirrors were glasses with parallel surfaces, which doubled the outlines of the respective images."

I have already sent you, Gentlemen, some notes on chromoscopes, and it will be abundantly clear from these, should you publish them, that Mr. Ives was again anticipated by Cros and du Hauron in this type of instrument.

Mr. Ives' attitude is curiously unfortunate for him. For if the alteration of the angle of a mirror, and, consequently, the complete design of the instrument, is an infringement of his patent, then by the same reasoning he himself has no valid patent.

Although this letter is somewhat lengthy, I crave permission to add yet another quotation, from the "B.J." of 1885, where it occurred in a controversy, very famous in its day, but which, being dead, is better allowed to remain so: "Moral objections exist to the recognition of any persons as authorities in photography, if they claim, as their own, discoveries previously made by others, because they promulgate them with a louder voice."—Yours faithfully,

Wollaston, Mass. E. J. Wall.

KEEPING TO ONE SHUTTER-SPEED EXPOSURE.

To the Editors.

Gentlemen,—In reference to the letter of Mr. L. T. Woods in your last issue, Mr. Sanderson will hardly thank him for his championship, for, as the report of the latter's lecture expressly stated, and, I believe, correctly, all his exposures on varying subjects in Italy were made at 1/100th of a second at *f*/6.5.

It is therefore unkind of Mr. Woods to say "I will not insult your intelligence by telling you exactly how I regulated exposures by the use of stops larger and smaller than *f*/8." I can, however,

assure your correspondent (whose identity is known to me) that Mr. Sanderson showed every sign of intelligence in advanced degree, even if his particular method of exposing plates is open to debate.

Mr. Woods' "new idea" is, of course, as old as the hills, and, as has been frequently pointed out, is the only method of regulating "instantaneous" exposures in cheap one-speed shutters. Apart from this, it is a little difficult to understand why "the system is of the utmost value."—Yours truly,

THE CLUB REPORTER.

To the Editors.

Gentlemen,—I observe that in your current issue a correspondent, Mr. L. T. Woods, indulges in a little sarcasm at the expense of the Croydon Camera Club.

Unfortunately, however, he entirely misses the point of the discussion which arose out of Mr. W. Sanderson's recent lecture.

As one who has used (and advocated) a constant shutter-speed exposure whenever possible, for at least twenty years, I should like to call attention to the fact that the criticism of Mr. Sanderson's 1/100 sec. was upon the point of its duration, and not its constancy.

Mr. Sanderson used 1/100 sec. at *f*/6.8 or thereabouts, and the contention was that some of his shadows showed signs of under-exposure. Surely it will be agreed by all that where both foreground figures and distant building are required in sharp focus an exposure of 1/30 sec. at *f*/11 would be preferable to 1/100 sec. at *f*/6.8.

At the same time this leaves a three-fold margin of power for opening up when the failing of light or depth of shadows calls for increased exposure. Mr. Woods' 1/30 sec. on his reflex is an excellent average, but personally I favour a longer time and have found 1/20 sec. fast enough for all average work, while with a box-form camera I have exposed some hundreds at as slow a speed as 1/5 sec. This permitted the use of a K.II. screen with *f*/8 for average work in our uncertain climate.

In conclusion, I feel I must express my regret that the cordial spirit of the Croydon discussions is somewhat lacking in your correspondent's letter.—Yours faithfully, V. JOBLING.

Carshalton. April 3.

PLATINUM TONING OF BROMIDES.

To the Editors.

Gentlemen,—As a practical worker and a one-time user of platinum for toning bromides I should like to support your "Ex Cathedra" remarks concerning the unsatisfactory and fugitive character of the results obtained.

When, in 1902, Mr. Somerville read his paper on the subject before the Royal Photographic Society, I was attracted by the process and the results shown, and produced many toned prints, most of which I have to-day. At the time of making, the platinum tones were particularly rich and of great beauty, but they began to "go" within about a year, and they have been going ever since. I am keeping them (many framed and exposed to light) just to see what the real end of them will be.

The inventor changed his methods of production several times, ringing the changes—if my memory does not play me false—with perchloride of platinum and potassium chloroplatinite, the latter being the better of the two.

Not having the facilities for toning a 20 × 16 print required, I approached Mr. Somerville, who toned it for me, he being a worker who produced very large sizes. This particular print (toned in 1903) has been hanging, framed, in a living room, in which have been plenty of gas fumes and above the average of tobacco smoke, for eighteen years. That the test is a rather severe one I willingly admit, but other toned and untoned bromides have been its companions during this period, and their "countenances" have not changed to any appreciable extent.

Of this platinum-toned enlargement only the centre part is distinctly visible to-day, the edges have changed to a yellowish tint, and over them appears a curious metallic sheen, while across the centre of the print runs a yellowish (faded) mark, the said mark being the place where the two pieces of backboard used in framing meet, thus admitting air. True, the process is far from being satisfactory. Indeed, I have some uranium-toned prints that have kept better.—Yours faithfully,

GODFREY WILSON.

NEGATIVES OF VICTORIAN ROYALTIES AND CELEBRITIES.

To the Editors.

Gentlemen,—A recent issue of the "British Journal of Photography" quoted a daily Press report of the death of Mr. Chas. Taylor, of Chislehurst, former photographer to Royalty by appointment, and who founded the Camden Studios during the residence of the ex-Empress Eugenie at Camden House, Chislehurst.

His widow, Mrs. Marianne Taylor, is unfortunately left unprovided for. She is 75; there are no children or living relatives on either side.

For many years she assisted her husband in all branches of the work, and has signed orders and testimonials from Queen Victoria.

The widow has a number of negatives, including Royalty and Victorian celebrities, a large show case, etc., and is open to accept any fair offer for the same. Her address is 38, Shirley Road, Longlands, Sidcup, Kent.—Yours faithfully, C. E.

ELECTRIC CURRENT AT POWER RATE.

To the Editors.

Gentlemen,—A question of great interest to photographers is shortly to be fought before the High Court, namely whether current used to produce photographs should be charged at 2d. as for power or at 8d. as for lighting. An electric supply company last year attempted to charge current supplied for photography at 8d. instead of 2d. (the power rate) as previously. In the face of a general protest from the profession this demand was afterwards reduced to 4d.; and for some time past 4d. per unit has been paid by certain photographers for the current they use for taking photographs. This is a mere compromise, and there is no legal guarantee that the companies will not again seek to charge the full lighting rate. The only rates provided for by the Acts of Parliament constituting electric lighting companies are the lighting rate and the power rate. Logically they must either charge at the power rate in operation at the time, or they must charge at the general lighting rate. No company is really entitled to charge a preferential rate to one class of customer or ratepayer or a different rate to that which they charge others of their customers or ratepayers for precisely the same thing. Clearly, therefore, the 4d. rate is an uncertain and unstable compromise—as being less than the lighting rate and more than the power rate.

We contend that current supplied for lighting is for that general illumination which enables us to see what we are doing, either for the purpose of pleasure or for the purpose of work. Again, current supplied as power is legally defined as that supplied for any purpose other than that of illumination. The current used for the making of photographs is obviously no more used *for lighting* than if it were used to actuate a Dowsing radiator or a cinematograph projector. Such current is used for industrial purposes. It serves to make those articles which the photographer relies on for a profit. He lights the room or studio in which he uses the arc or other lamp for photography by current for which he has to pay the lighting rate, but the arc or other lamp does not serve as an illuminant to any greater extent than would a magnesium wire or an explosion of gunpowder.

Until we made a stand last year, professional photographers were apparently prepared to sit down under a charge of 8d. per unit for current which had for years previously been charged at power rate, that is, from 1d. to 2d. per unit. It was not until we urged the Professional Photographers' Association, that the body moved, and as a result of negotiations with the electric lighting company in question the proposed rate of 8d. was compromised at 4d. per unit. We never assented to that compromise, and are now fighting to secure the power rate which is at present 2d. per unit, and was 1d. per unit before the war.

Owing to what we contend is the failure of the Professional Photographers' Association to fight this important matter, we now lay the above facts before photographers generally in the expectation that they will give us their support. Every photographer who uses electric current for taking photographs is concerned to secure the necessary current at ordinary power rates.

Will our brethren help us morally or financially or in both ways to fight the matter to a finish?—Yours faithfully,

WYKEHAM STUDIOS, LTD.

165, Victoria Street, S.W.1
April 4, 1922.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

W. E.—The following are the addresses for which you ask:—Messrs. Hood & Co., Sanbride Works, Middlesbrough; Messrs. Walter Pearce & Co., St. George's Press, Brentford, London, W.

A. L.—The French manual on "Air Brush Work" is published by Messrs. Charles Mendel, 118, Rue d'Assas, Paris. The most professional photographic journal in German is "Das Atelier," published by W. Knapp, Muhlweg 19, Halle, Germany.

J. N.—As you have the "Almanacs" for the past ten years we would refer you to the issue for 1913, which contains an article on fitting up the dark room, and, incidentally, deals with formulae for safelights. Really it is better to buy safelights than to make them. Messrs. Wratten have a series for different types of emulsion which cannot easily be improved on.

G. W.—There is no need to do anything in order to obtain protection of the copyright in your photographs. The copyright becomes your property automatically by the fact of your taking the views without receiving an order from anybody to do so. We suggest that the little manual, "Photographic Copyright," issued by our own publishers, will serve you usefully on many other points connected with copyright.

A. R.—As you do not say the focal length of your present Cooke lens it is rather difficult to advise you. Presuming the lens is from 6 to 7 ins. focal length it is about the best average focus for views, groups and Press work. The only object in having a telephoto would be to get a focal length of from 12 to 15 ins with your present camera extension. We think you would find that the opportunities for using such a focal length would be comparatively few and far between.

F. N. E.—(1) The reversing methods are not satisfactory with dry plates of the thickness of coating of those generally sold. The method works satisfactorily only with a very thin coating of emulsion, like that on the Autochrome plate, and on one or two very special plates. (2) MM. Lumière, agent Mr. T. K. Grant, 89, Great Russell Street, London, W.C.1, and Paget Prize Plate Co., Watford, Herts. (3) No; ordinary plates of this kind are just as thickly coated as others, and, as already said, are unsuitable for the reversing process.

F. L.—(1) There is no book published on the production of view postcards, but some years ago a series of six articles by Mr G. T. Harris, himself a large publisher of view cards, appeared in the "B.J." of March 29, April 5, 12, 19, 26, and May 3, 1912. These issues can be supplied by our publishers at the price of 2s. 6d., post free. (2) The ordinary enamel will serve as a protective varnish for tin trays to be used for developing, although the coating does not last very long. A more permanent varnish is that sold by dealers in electrical requisites as "anti-sulphuric paint."

H. N.—Hydrofluoric acid, which is the only acid that will attack glass, is such a corrosive agent that we do not think it is possible to prepare a sensitive emulsion which will act as a resist for it in the etching of glass. The resist for glass etching is wax, or similar material, and so far as we know such substances could not be prepared in the form of silver emulsions. The only direction in which experiment might hopefully be made is in the use of sensitive bitumen. By special treatment bitumen can be made much more sensitive to light, but, in any case, exposures are, of course, very much longer than for any silver bromide emulsion.

P. G.—(2) The following is the method for making ox-gall glazing solution:—To the contents of one ox-gall, to be obtained of most English butchers at a cost of about sixpence, add one gallon of water, two ounces of glycerine and two drams of formaline. This will keep almost indefinitely in a stoppered bottle, the quantity required for use each time being poured therefrom into a jar or basin in which the rag used for applying is soaked. This is the ordinary strength for general use; for the first application to new glasses only half a gallon, or less, of water should be used. It is rather a messy business. A specially purified form of oxgall is supplied by Messrs. Rheinlander & Son, Rodney Road, New Malden, Surrey.

F. D.—(1 and 2) If you have a permanent or semi-permanent place of business where people can come and buy the photographs of the groups that you make no licence is necessary, but if you canvas people for orders at the time of taking the groups then, in many districts, the police require you to have a hawker's licence. You should apply to a chief police office for information. (3) No, a certain licence only applies within a given district. (4) To make a 10 per cent. solution dissolve 2 ozs. in water and make up to a total bulk of 20 ozs. If a 40 per cent. solution, dissolve 8 ozs. in like manner. For a 4 per cent. solution it will be near enough to dissolve $\frac{3}{4}$ oz. in like manner, and for a 3 per cent. solution dissolve 263 grs. in like manner.

G. W.—There is no reason whatever why you should not take any views you like, even though there may be in existence and on sale postcards taken from practically the same standpoint which you will choose, and, therefore, very closely resembling the post cards which you will make. The copyright in these existing cards is only infringed by copying the cards themselves. We think you should take the views in the first instance "on your own," that is to say, you should not do them to the order of your trader friend. If you do the latter, the copyright in the works becomes his, and if he liked he could discontinne ordering the cards from you, bnt could have the prints copied and thns deprive you of the benefit of your work. The thing is often done, and, of course, it has the further evil effect that you would be prevented from making a further single print from the negatives in your possession.

J. B.—The usual method of sepia toning, namely with the bromide ferricyanide bleach and sulphide darkening bath, gives dark tones of the kind shown by the specimen with many papers. If, however, you want to ensure darkness of tone, probably the best method is to place the bleached prints for a short time in any diluted and restrained developer, afterwards transferring them to the sulphide solution. This method was worked out by the technical department of the Kodak Co. a year or two ago and works very well, but, of course, needs more skill and supervision than an ordinary method, and has the disadvantage of an extra bath. Really we think your best plan would be to take the ordinary formula, and try a dozen or so different brands of paper, selecting the one which most nearly gives you the tone you are seeking.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3232. Vol. LXIX. FRIDAY, APRIL 14, 1922. Price Fourpence.

Contents.

SUMMARY.

The issue of the "British Journal" for April 28 will contain a full advance notice of the Photographic Fair, and will direct attention in particular to new introductions in photographic apparatus and materials to be seen for the first time at the Fair. (P. 209.)

In a contributed article Mr. A. H. Hall deals with some special points in the working of the Carbro process. He prefers to bleach and re-develop prints on warm tone development papers when making Carbro prints from them. Incidentally he finds that a print from which one or two Carbros have been taken is specially suitable, after re-developing and drying, for Bromoil pigmenting. (P. 212.)

In a leading article we lay stress upon the need of washing before fixing as well as afterwards. Alkali from the developer quickly neutralises the acid of an acid fixing bath. We give some hints also on testing for complete fixation and on washing after fixing. (P. 210.)

Mr. Loyd A. Jones and Milton F. Fillius, in a paper from the Eastman Research Laboratory, describe the experimental methods which they have devised for the measurement of the gloss or mattness of photographic printing papers. The second part of their communication, to appear next week, contains the results obtained. (P. 216.)

Mr. E. A. Dench describes some characteristic styles of window dressing of photographic stores adopted by dealers in the United States. (P. 214.)

Dr. Henry B. Goodwin, of Stockholm, who is now in London, is using his healthy influence against the sham artistic effects shown in much of the modern photographic portraiture. (P. 209.)

The Edinburgh Society of Professional Photographers is considering the question of alliance with the sister Society in Glasgow, with a view to the formation of a Scottish and North of England Professional Photographers' Federation. (P. 221.)

The Lancashire Society of Master Photographers is holding its annual meeting and a conference at Blackpool from May 15 to 20. (P. 221.)

The combination of silver phosphate and an organic ferric salt as the sensitive coating for a photographic printing paper forms the subject of a recent patent specification. (P. 219.)

A wider angle of view may readily be obtained with a given lens by stopping down very greatly and racking the lens nearer to the plate than would be possible if it were used at a larger aperture. (P. 210.)

Many hints on the use and preservation of photographic materials in the Tropics are given by a contributor to the "Camera." (P. 212.)

The Royal Photographic Society will awaken echoes of its early association with the Royal Society of Arts by holding a meeting next month at the house of the latter in John Street, Adelphi. Apropos of this event we refer to the many homes which the R.P.S. has had in contradistinction to its more fortunately housed sister body. (P. 210.)

EX CATHEDRA.

The Fair. Not many days will elapse after the Easter holidays before the Photographic Fair opens at the Horticultural Hall, Vincent Square, Westminster, on Monday, May 1, remaining open until the following Saturday. Photographic manufacturers, dealers, and firms undertaking printing, etc., for the professional photographer will be as fully represented as at recent fairs, which is saying a good deal. Inasmuch as a review of the exhibits of the Fair could be published in the "British Journal" only on the day before the closing, we shall again adopt the plan of publishing a detailed advance notice, namely, in our issue of April 28. Particulars of their exhibits, and especially of new introductions, have been given to us by the exhibiting firms, so that we shall be able to serve intending visitors by way of drawing special attention to new apparatus or materials which will be introduced upon the photographic market at the Fair. As was perhaps to be expected, the number and variety of these new goods are notably greater than at the previous post-war fairs. A glance at the article which will appear in our issue of April 28 will serve to show what they are and at what stands they are to be seen.

* * *

Dr. Goodwin. Dr. Henry B. Goodwin, of Stockholm, the exhibition of whose portraiture is now open at 35, Russell Square, is perhaps as vigorous and fearless a controversialist as any which photography has known since Dr. Emerson stirred the pictorial ranks to their foundations. Yet we are inclined to think that, in the heat of his denunciations of the theatrical and sophisticated styles which now debase so much of the modern portrait work, he has not proclaimed as loudly as he might profitably have done his own creed of a tireless study of people and character and of the technical means of character rendering. We are referring to the few remarks which he made at the Royal Photographic Society last week, and to the address which he was to have delivered last Tuesday, a report of which cannot appear in this issue owing to its earlier publication before Easter. Fortunately, the hundred or so examples of his art, which can be seen at Russell Square until the 19th inst., form as admirable an exposition of Dr. Goodwin's teaching as could be wanted. Their technical perfection is a quality which must not be allowed to obscure the motive of which they are the expression. The portrait photographer ought on no account to miss the opportunity of seeing them, for from them he can obtain the healthiest and most invigorating stimulant to artistic work of enduring value which has been available for a long time. Nobody can look at these portraits of men and women without feeling that, with scarce an exception, they are character renderings of the subjects. Dr. Goodwin has a style, but it is not one which is forced into every portrait he takes, but undergoes numerous modulations appro-

priate to his theme. He and his work are a healthy antidote for the theatricality in portraiture of which we are getting too much.

* * *

Wide Angle Dodges. In these days of expensive anastigmats there are few workers who have the large assortment of focal lengths in their lens kit which was common some years ago, and it is often found that a lens shorter by an inch, or even half an inch, is needed to include the necessary angle. An old dodge which may not be known to all our readers is to use an exceedingly small aperture, say *f*/90, and after focussing to rack in the bellows until the whole of the subject appears on the screen. Theoretically, the definition should be spoiled by diffraction, but in practice this trouble does not arise, the definition being much better than that obtained with a pinhole of very much smaller diameter. Temporary diaphragms may be made from thin vulcanite or even black paper, and should be placed in contact with the leaves of the iris, taking care not to strain the latter. A weak positive meniscus spectacle lens placed close to the front combination will materially shorten the focal length and will not be found to affect the achromatism of the instrument, the small aperture necessary for this class of work covering a multitude of small errors. Old wide-angle rectilinears and portable symmetricals may often be picked up very cheaply, and afford very good investments for the technical photographer.

* * *

The R.S.A.— There has always been a close relationship between the Royal Society of Arts and the (now) Royal Photographic Society, for it was at the Society of Arts that the Photographic Society of Great Britain was housed at the outset of its career. Even during recent years, but before the Photographic Society was as popular as it is to-day, important papers on photography were read before the "Arts" rather than before the "Photographic." The "Arts" also (in 1895) offered cash prizes and medals for photogravure work, and did much to encourage early workers in colour photography. It is announced that the freehold of the premises of the Royal Society of Arts in John Street, Adelphi, where a meeting of the Royal will be held on May 9, has just been secured. The sum required for the acquisition was £50,000. Towards this £42,000 has already been subscribed, one generous donor—who insists on remaining anonymous—having given £30,000. The first meeting of the Society took place at Rawthmell's Coffee House, in Henrietta Street, Covent Garden, on March 22, 1754. The Society eventually entered into a contract with the Brothers Adam to build the premises in John Street, Adelphi, which have now been its home for a century and a half, but only as tenants. At the time the Society was formed there were only two others. One was the Royal Society, which dealt with pure science, and the other was the Society of Antiquaries. The membership now is upwards of 4,000. It is the intention of the Society to restore the interior of the building, so far as is compatible with modern requirements, to the state in which it was left by the Brothers Adam.

* * *

—And the R.P.S. In having the same home for a century and a half the "Arts" has been more fortunate than the "Photographic," the latter having to carry out a long series of flittings. In the first year of its existence the "Photographic" met, as stated above, at the "Arts," but at the end of the year (1854) took rooms for itself at 41, Regent Street (since re-numbered, the original home being demolished about 1885). In 1857 the Society became too large for its rooms and migrated to New Coventry Street, where it remained till 1860. A move was then made to King's College, Strand (too much money being spent in New Coventry Street), where it remained till 1867, when it removed to 9, Conduit Street. There it remained for nine years (till 1876), when straitened resources once more induced a move to the Gallery in Pall Mall. Economy won, and in 1890 the desire again arose for better premises with offices, and a fund was set on foot for the purpose of covering the cost. The result was satisfactory, and rooms were taken at 50, Great Russell Street, where the Society remained until June, 1895, when a move was made to Hanover Square. The move to Great Russell Street gave the Society a new life, and it was here that it forced itself to the front. Moves to Russell Square followed, first to No. 66 (from which address it was driven when the house was demolished to make room for the Imperial Hotel), and last of all to No. 35 on the opposite side of the Square. The early history of the Society's wanderings was dealt with in the President's annual address in 1895. The fullest details of the very earliest struggles of the Photographic Society are, however, those given in the Report of the Jurors of the Photographic Section of the 1862 Exhibition, written by Dr. Diamond.

WASHING, FIXING, WASHING.

BECAUSE the results are not immediately apparent much less care is usually bestowed upon the washing before and after fixing, and the operation of fixing, than upon development in which carelessness and errors of judgment are at once visible.

In many establishments it is now the custom to pass both prints and negatives direct from the developing solution into the fixing bath without even rinsing. This is an unwise proceeding, as not only is it a possible cause of uneven markings, but it quickly introduces into the hypo solution a large quantity of chemicals which no sane person would add in making up a fresh bath. When a neutral or alkaline fixer was generally used this contamination was manifested by the darkening of the solution, but with the acid fixer there is no such warning, and there is great danger of overworking it to the ultimate detriment of the negatives and prints fixed therein. It is therefore a wise precaution to wash away the developer as thoroughly as circumstances permit before fixing.

Most developers contain a fair amount of alkali, and most fixing baths contain but a small quantity of acid, and that acid not a very powerful one. Consequently, the acid content is rapidly decreased and its stain-preventing qualities reduced. It may be thought that development may continue to an undesirable extent during this intermediate washing, but this is a groundless supposition, except in the case of over-exposed bromide prints, when the acid bath serves to stop development. Yet trusting to this is illusory if the acid has been neutralised as we have indicated above. A simple and effective way of washing is to have a large dish of water into which the tap is kept running, and to move the negatives or prints about in it for a few seconds. With negatives, the dish may be dispensed with if a rose is attached to the nozzle of the tap.

The acid fixing bath unfortunately remains fairly clear long after it is capable of doing its work properly, and much trouble, the cause of which is unsuspected, arises. A wise precaution is to note the time taken to remove the visible silver bromide in a newly-made hypo bath and to discard the bath when double this time becomes necessary. At least, double the time necessary for clearing should be allowed for proper fixing, but it is not desirable to allow prints or negatives to have a too prolonged stay in the hypo bath, as with some conditions

of the solution an appreciable reduction of the image may occur. No definite time can be indicated for fixing, as plates and papers vary greatly in this respect. A process or ordinary plate often fixes in a third of the time necessary for a rapid portrait emulsion, while with bromide papers the hardness and permeability of the coating cause a similar variation. A simple test is found in a solution of sodium sulphide of the strength employed in sepia toning. If the plate or film shows the slightest yellowing upon immersion in this it is a sign that the undeveloped silver bromide has not been removed. This explains the fact that some workers cannot get clean whites upon their toned bromides, which often appear as if a cream paper had been used. With imperfectly fixed negatives mercurial intensification gives uneven brownish stains, which will also appear after a lapse of time, when intensification has not been resorted to.

Thorough washing after fixation is upon all hands allowed to be of prime importance, but it is not always carried out. It must be clearly understood that it is not upon the quantity of water that is used, but upon the way in which it is applied, that efficiency depends. Many washing tanks are sadly defective in their action, the plates being too close together, without there being any proper means of securing circulation of the water between them. Even with a plentiful supply of water it is advisable to empty the tank thoroughly several times, so that there is a certainty of fresh water reaching each surface. If this be done the time of washing may be curtailed considerably. A final rinse under the tap, accompanied by a gentle wipe with cotton wool or wash leather, should always be given, as this removes from the surface any deposit of lime from the developer, fixer, or washing water. To prevent "tears" or uneven drying a little dodge recommended by a correspondent, Mr. D. Charles, many years ago will be found effective. It is, to allow the water to flow evenly over the surface and to transfer the plate to the drying rack without allowing the water to run back. It will then recede in an unbroken sheet and leave an even surface. In the winter, or at any time when quick drying is necessary, the surfaces should be blotted off or wiped as dry as possible with a clean fluffless cloth.

Print-washing arrangements are usually even less effective than those used for negatives, by reason of the tendency for the prints to stick together. Nothing is better than hand washing, that is to say, transferring the prints singly from one dish of water to another, six changes with five minutes in each water being quite safe. A useful modification of this is found in the cascade washers which are now becoming deservedly popular. These consist of a series of large trays arranged like stairs with a continuous stream flowing through. The prints are first placed in the lowest tray, and after a few minutes' interval placed in the higher ones in succession. It is, of course, necessary to give a good rinsing to the prints before placing them in this apparatus, or the sojourn in the lower tray will not be very effective.

NOTES ON THE CARBRO PROCESS.

The carbo process, eliminating as it does the need for an enlarged negative, has undoubtedly come to stay, and, worked methodically, the results are certain and can be repeated at will.

Though part of the manipulation bears a close resemblance to that required for the production of a carbon print, there are certain differences which may cause trouble and which are dealt with in the text.

It is assumed that the operations requisite for the production of a carbro print are known, either from the details published in the "British Journal," or from the pamphlet issued by the Autotype Co.

The basis of the process, the bromide print, is of prime importance, and the writer has yet to find a type which will not give good results if the right quality of print is provided, and both here and in the subsequent operations temperatures should be taken. A print which has received less than two minutes' development with a normal developer at 60 deg. F. should not be used.

A print a trifle on the dark side is recommended, though a normal print with rather longer between the period of squeegeeing on to the transfer paper and development will give good results.

Very excellent prints are obtained from weak negatives printed on the glossy contrasty paper so much used for press-work.

The chloro-bromide papers which give warm or brown-black tones will give excellent results if the print is first bleached in the usual ferri-cyanide and bromide bath used in sulphide toning, followed by complete redevelopment. To those who, like the writer, make the majority of their prints on this type of paper, the extra operations are well worth the trouble. The extra depth which is a feature of this type of emulsion is an advantage, and the print should not be too dark. The best print which can be obtained from the negative is just right with this class of paper; and a rather longer immersion in the No. 2 bath, *i.e.*, the bath containing formalin, acetic and hydrochloric acid is advisable, and here 30 secs. can be taken as the normal time.

One of the troubles which has been experienced has been a tendency for the high lights to wash up. A print should on no account be too hard.

As regards the solutions recommended by the Autotype Company there is little comment to make, except that the stock solution of potass ferri-cyanide, bromide and bichromate will in cold weather crystallise out to some extent as regards the bichromate, and, of course, failure will result if the working bath is made up on such circumstances.

During all the operations the temperature appears to be most important, and heavy blocked-up shadows lacking in detail will result if the solutions or the room in which the prints are worked are below 60 deg. F. It is as well to keep as near to 62 deg. F. as possible throughout.

Much modification of the print is possible by varying the time in the No. 2 bath, and this appears to be a point where improvement in the process is possible. The normal time of immersion, 20 secs., is too short, as an error of a few seconds is such a large percentage of the whole as to make a considerable difference.

The writer has not yet experimented with a modified bath, but one timed to give an exact reproduction of the bromide with an immersion of, say, 60 secs., would be wonderful.

Care must be taken in placing the pigmented paper on the bromide to prevent slipping, or a double image may result, and a convenient method of obviating this is to lay a flat boxwood ruler along one edge of the plaster and hold it down tight while the remainder of the print is being squeegeed.

Special boards made with a folding flap to achieve the same result are obtainable.

When the pigmented plaster has been in contact with the transfer paper for 30 minutes—a shorter time is not recommended—the two are placed in water at 95 deg. F. This temperature is lower than is usual for carbon printing, and should be measured with a thermometer, while if the time the pigmented paper has been in contact with the transfer paper before development exceeds 30 minutes a somewhat higher temperature is advisable.

The development is usually quicker than with carbon, and after gentle splashing with water on the face to remove the bubbles which show on the deep shadows, the remaining pigment which is soluble can be easily removed by holding the print under water by one end and shaking it to and fro quickly.

Some trouble has been experienced, and this is not confined to the writer's efforts, in using old tissue which shows a tendency to pull up in the shadows when trying to strip the backing. This, even with pre-war carbon tissue, only occurs at times, and hotter water for stripping should be used; but the tissue now supplied by the Autotype Co. and labelled for carbro works so easily that it is better to get a fresh supply.

As regards the mechanics of the process, if one pigment plaster is immersed in the sensitising solution (normal time three minutes), and after two minutes a second is put in, the two minutes intervening between the time when the first is taken out for immersion in No. 2 solution and the second is ready for the same operation, leaves just sufficient time for the subsequent operation of squeegeeing and placing the first print between waxed paper to be comfortably performed.

As 15 minutes is the time for contact of the plaster with the bromide print, it follows that five prints can be treated one after the other, but as the transfer papers have to be wetted this is rather a rush, and it is better to be content with four. The fourth print having been completed as regards squeegeeing to the plaster in ten minutes, will be ready for its final home on the transfer paper after twenty-five minutes from the start. The first print is ready for development after 45 minutes—*i.e.*, 15 minutes in contact with the bromide and 30 minutes on the transfer—so that 25 minutes having been expended up to and including the fourth print will leave about 20 minutes for a fresh batch to be started, and the earlier operations repeated, before the first print is ready for development. If therefore a second person can be employed for the simple operations of development and aluming, the process can be practically continuous for as long as is required, each print prior to development taking an approximate time of 6½ minutes.

The times of squeegeeing the tissue on to the bromide should be noted in crayon on the back, so that the correct time for contact can be maintained. For those interested in the bromoil process it is worthy of note that a print from which one or two carbros has been taken, and which has been redeveloped and dried, is in a specially suitable condition for this process and will usually be found to pigment exceptionally well.

A. H. Hall.

KEEPING PHOTOGRAPHIC MATERIAL IN THE TROPICS.

[The following article, which we reprint from an American contemporary, "The Camera," describes how difficulties when using films in the tropics were overcome.]

Few travellers go abroad nowadays without a photographic equipment. Yet not many take the trouble to foresee and prepare for the special conditions under which photography must be pursued in the countries visited. The tropics, especially, present all sorts of difficulties. Among dozens or scores of camera carriers whom I have met in two trips to South America, I have encountered no one who had attempted to solve these difficulties. One or two expert photographers were securing a very low per cent. of good negatives, and were taking no special precautions to safeguard those few. And still everyone knows how much good pictures depend on taking care at every step.

Nearly all stages of photography are subject to special troubles due to high temperatures and high humidity. The unexposed film, the exposed film, the processes of development, fixation and washing, the negatives, and all the printing processes must receive special care. My own difficulties were multiplied by the necessity of constant travel, which meant a reduction of equipment and working under makeshift conditions.

I have experienced little deterioration of unexposed film. That problem has been well solved by buying film sealed for tropical use. However, in travelling across the Andes, the decrease in atmospheric pressure at high altitudes caused the foil tubes to bulge, and a few showed evidence of having admitted air. As an additional precaution I kept the films packed well in the centre of packing boxes, surrounded with crumpled newspaper. At convenient intervals I would unpack everything for a thorough drying. When travelling with pack animals, I did not risk the entire photographic outfit in one pack, but distributed it among several loads of material. This proved a wise precaution, for one animal did stumble and fall on his pack while fording a river.

Filmpack has shown less deterioration than roll film in my experience, possibly due to the intervening air spaces. Roll film seemed to improve in this respect when I had learned not to wind it too tightly, after exposure.

Most workers have found the caution against over-exposure an easy one to follow, and live up to it too well. The tendency is often to under-expose through excess of caution. Such is certainly the case in murky weather and in the dense shade of the tropical forest. The result is that many negatives are nicely exposed for the high-lights and make a good appearance, but over-print the details in the shadows. Another trouble which puzzles the newcomer is that a film may become wrinkled and uneven, due to moisture, while in the camera. Of course, some parts of it are then out of focus. This can be avoided only by keeping the camera well protected from moisture, especially during the tropical nights.

The real difficulties begin when the film is exposed. In all climates the exposed film suffers from the continued action of sunlight. That is, when exposure has been made, the affected areas continue growing denser and denser, until after a long time the result is an over-exposure—at least an exposure greater than originally calculated. This effect is apparently heightened in a humid climate, due to moisture in the film. Moisture does not attack all parts of a film surface equally, but in patches, depending on the way air is admitted, and on the contact with the black or ruby paper. The over-exposure is consequently uneven also, so that it cannot be compensated

for in printing. Both before and after development films may be attacked by mold.

Development, fixation and washing are the most fruitful of trouble. When travelling constantly it is out of the question to carry stock solutions, both on account of bulk and rapid deterioration. I have found it advisable to carry a considerable excess of dry chemicals and to make up fresh solution whenever needed. Special care must be taken to keep the chemicals dry in transit. Airtight containers should be used, for the chemicals absorb moisture from the air and become soft and semi-liquid. This makes it difficult to follow the formulæ.

The temperature of the bath is very difficult to regulate. I have taken the temperature of the natural waters of tropical Peru and Brazil in many places. There is almost a complete uniformity—river water and spring water were always near 80 degrees F. This is exasperatingly near the melting-point of the gelatine, and working with it raises its temperature still further—above the critical point. Even when water is allowed to flow about the trays it is too warm to accomplish much. Working with such water is on the border line of impossibility. Tropical developers are designed to extend the range of working temperatures some 20 degrees. I carried a supply of them, but while travelling constantly, did not find conditions suited to their use.

On a few occasions I was able to catch considerable quantities of rain water having a temperature of less than 70 degrees F. If used at once it served very well, through surrounding the baths with the cooler water and changing frequently.

The only really satisfactory arrangement is to surround the baths with ice. By using plenty of ice, exact temperature control can be had. Even then, if the air is humid and the films dry slowly, trouble may appear while the film is hanging wet. But it is only in the larger cities that ice may be had at all. Without the use of ice I have experienced all the following troubles in development: A longitudinal checking of the gelatine, which may or may not disappear on drying; reticulation, pinhole, stain, frilling and loosening of the gelatine, fog, etc. Few perfect negatives were obtained without ice, though a large number of good ones survived through taking all possible care.

The longer the film remains in baths near the melting point of the gelatine the greater is the injury. It is important to remove it then at the earliest possible moment. Certain of my negatives, under-developed by the tank method and intensified on returning home, turned out to be among the best in printing qualities. This suggests that it may be a wise policy to expose well, to under-develop consistently and re-develop later when necessary. Formaline-hardened film is said to be too brittle to allow wetting again, but none of mine showed any loosening of the gelatine in the intensifier.

If working at high temperatures, the developer cannot be used for more than one or two films at most. For that reason it must be used in small quantities and the small two-powder packages made up for amateur use are a very convenient form. Having the fixer strong and fresh shortens the time the film must remain in the solutions. The washing must be reduced to a minimum when warm water is used. Rapid rinsing through several changes is imperative.

More vigilance is necessary in safeguarding the negatives after drying than the sealed unexposed film. They must be kept dry and isolated from each other to prevent mildewing or sticking. If 10 per cent. formaline is used for the last wash water the film is hardened considerably. I have found negative albums the safest means of carrying negatives, and after all they are no more bulky than any other arrangement.

Printing equipment I have always left at home and deferred the pleasure of seeing prints until my return. This, of course, simplifies one's outfit considerably. Bulk may be further cut down by planning to do developing at night and reducing the dark-room outfit. Trays, tank, thermometer and candle lamp will answer. Film clips are of vital importance.

If one is located rather permanently in a large city where ice may be had, it is worth while to equip a dark-room, and most of the above difficulties will be avoided. But in the field such is not the case. From the foregoing account it is clear that one must solve the problem of saving the film in one of two ways—i.e., either one must be able to develop film at frequent intervals under adverse conditions or one must be able to carry exposed film a long time until reaching a suitable place to do his work.

Tropical developers are a more or less successful attempt to solve the problem in the first way. This article is written especially to show how I have met the situation in the second way, as will be seen in the following paragraphs:—

Manufacturers of film warn the user not to seal it again after exposure in the tropics. To do so would enclose a certain amount of moisture with it. They argue that it is better to allow it to ventilate than to sweat in an air-tight container. My attempt has been to find a way of storing film dry by enclosing it in a dry chamber, and the resulting device is shown in the photographs (figs. 1 and 2). If the humidity and temperature are not permitted to become excessively high there is no reason why film should not enjoy as long life in the tropics as elsewhere. Temperature control has not been so difficult as might be supposed. It is mostly a matter of keeping the container in the shade. The obvious solution of the question of

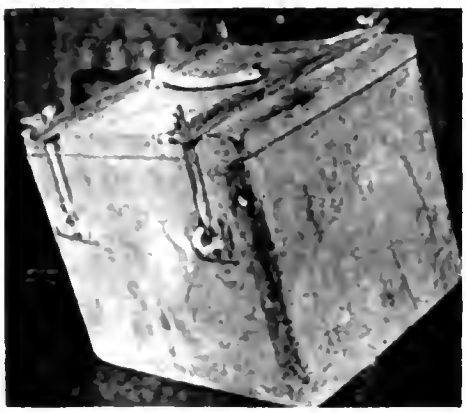


Fig. 1.

Fig. 2.

humidity was to enclose with the film a quantity of a deliquescent salt to absorb water. This I attempted to do with chloride of calcium. But this obvious plan did not succeed, due to the difficulty of drying the salt.

I had about despaired of making the hermetically sealed chamber successful when a very simple solution came by chance. I had dried some old newspapers used for packing and went to

gather them just as the sun was setting. It was a region of heavy dews, and I found the paper already damp when I picked it up. It then occurred to me that crumpled newspaper, easily dried in the sun and readily taking up moisture again, was the thing needed to complete my film-box. From that day forward there was no trouble. The box was kept closed except near the noon hour on bright, sunny days. I never opened it at night, on cloudy days or after recent rains, even to add films. Luckily at such times little film is ever exposed. Whenever a good drying day came I was sure to spread the open box and the crumpled paper in the sun for an hour, and the exposed films in the edge of the shade.

No detailed description of the box is needed, for the idea is quite adaptable, and suited to either the use of crumpled paper or any other desired drying agent. The figures will be a sufficient explanation. Hermetic closure of the box was secured by its soldered zinc lining, its rubber gasket and thumb-screws. The bolts should be battened to prevent the loss of the thumb-screws. The box was made sufficiently large to hold considerable film and two folded cameras. Only in case of great and continued humidity is it necessary to keep the cameras in it.

There are three sorts of evidence which demonstrate that the device is successful:—(1) When the box has been opened after a week or so of wet weather, the paper still felt dry and crisp to the touch. (2) My best negatives are those which were developed at home in a dark-room from eight rolls and filmpacks that had been exposed four to six weeks before in the upper Amazon country. They arrived still fairly free from humidity after a fortnight on the Amazon and an equal period at sea, with no perceptible defects due to dampness. (3) At first I carried my negative albums in other containers. Some negatives were placed back to back by twos in the pockets of the albums. Whenever baggage was opened and spread out to dry, the albums were aired as well. But the negatives were sure to be damp and sticking together more or less. Then I began keeping the albums also in the closed box. They never again felt soft and humid and there was no further sticking. It is reasonable to suppose that the undeveloped exposed film in the box was likewise much drier than it would have been outside.

While I may not have eliminated all film trouble in the above way, I believe I have reduced the risk to a point much below the risk assumed in trying to develop film in warm water. If the traveller has access to ice every two or three months the method will enable him to save has exposed film for a much longer period than has usually been safe, and enable him to wait for suitable working conditions. The method may be worth all the trouble in merely safeguarding negatives.

M. R. Allen.

PUSHING CAMERA SALES.

We have camera enthusiasts with us all the year round. But by far the greater portion of them again take up the hobby with the first touch of spring. Right from then up till the late autumn is the harvest time for cameras and accessories.

You should be there with attractive window displays—window displays which reflect the season of the year.

The Doll Photographer.

The Quality Shop, Washington, D.C., U.S.A., had a pleasing camera display. Seated on an empty camera carton was a large doll. She held the small camera that had come out of the carton. The camera was fastened over the doll's hands with a rubber band, and the doll was posed in the attitude of taking a picture of three "Splash Me" dolls, reposing on an empty camera box at the other end of the trim. A card at the centre front announced: "Look Pleasant, Please."

A Tennis Net for Atmosphere.

Koeniga, Newark, N.J., enclosed the rear of their camera window with a tennis net, which was decorated with seasonable flowers, with photographic booklets hung at intervals. The net was bunched like rosettes at the sides. Cameras were exhibited on the floor of the display.

Studies in Good Times.

Willoughbys, New York City, attracted attention to their display by a series of painted panels. These panels, enclosed in gilt frames, were placed across the background. The first panel showed a gipsy girl carrying a jug of water to her caravan, which was drawn up by the country roadside. The subject matter of the second panel was that of a modern maid having her fortune told under a tree by a gipsy. The third panel dealt with a city chap using his camera in the woods. The middle panel simply bore the following caption :—

"Good Times are in Store with a Kodak."

Cameras and accessories were neatly set about on the floor, with cards describing the uses for each article. Here are some examples :—

"Stop guessing distance. Use McMillan's Distograph and obtain sharp pictures."

"A simplified method of developing your own films. The ——— Tank. Ask for demonstration."

"For speed pictures—a Reflex. You see the image up to the moment of exposure."

"Use a colour filter when photographing clouds and flowers these days."

"Knowledge is power. Come in and see our selection of photographic publications."

At the Beach.

The Kern Music Co., Providence, R.I., desired to make camera sales to folks going away to the beach over week-ends and on holidays. As a window display feature, they introduced the wax model of an attractive young woman, attired in a cerise one-piece bathing suit. A green cape partly draped one of her shoulders. The floor underneath was carpeted with artificial grass (beach sand and pebbles would have been more appropriate), with cameras and films laid about the same.

Another Beach Setting.

The Robey-French Co., Boston, Mass., covered their window floor with green crêpe paper, with a square plot at the centre rear covered to a depth of two inches with beach sand. There was a bathing girl kewpie doll lying on the sands, with her head protected from the blazing sun by a miniature parasol. Over the other side of the sand was a second bathing girl kewpie, with a camera in her hands, focussed at the first kewpie. Little bits of atmosphere were provided by a beach pail and spade. The space elsewhere in the display was given over to cameras.

Concentrating on One Camera.

Wheeler's Claremont, New Hampshire, concentrated their window display on the 2C Kodak. Their window floor was draped with white crêpe paper, with samples of work done on the camera exhibited here and there. One of the cameras was displayed on a mound at the rear centre. Across the rear was a three-panelled screen in light green, with a card on the middle of each panel. These cards bore such messages as those given below :—

"Wise men who travel carry a Kodak."

"Kodak as you go."

"For the out-of-door days—Kodak."

A Neat Display.

The Almer Coe Co., Chicago, Ill., arranged cameras on white enamel plates, with an occasional camera placed on a raised glass pedestal. On a raised plate at the front centre were several small articles needed by photographers. Albums, opened to show what the photographs were like, were leaned against the background.

The window down by the glass sloped up, and on this wooden base camera pictures of local interest were placed.

The Camera Bellows.

The Denver Photo Co., Denver, Colo., achieved the effect of camera bellows in an ingenious manner. Cheese cloth was stretched out from front to rear, the smallest portion being at the rear, where the bellows met almost at a common point. Here the lenses of a camera were placed.

Verifying that Fish Story

The North-Western Photo Supply Co., Seattle, Wash., adorned the background with a large framed picture of the lake and mountains. The opposite rear side was occupied by a coloured picture of fishing tackle, with fish surrounding the basket. A bunch of real fishing tackle was placed on the floor at the centre, with a card that advised :—

"Let your camera verify your fish story."

A Daily Reminder.

Cunningham's, Detroit, Mich., had a large sign over their camera counter with space left for the insertion of a small white card, which is changed daily. On the particular day that I entered the store the sign announced :—

"Sunday, September 5.
Buy that Camera to-day."

Clever Way of Using Prints.

The Seattle Film Shop, Seattle, Wash., was responsible for a simple but effective glass-case display. The word "Kodak" was spelled out on the showcase floor with the aid of camera snapshots. The prints were arranged over a black crêpe covering, and ran down the case in a zig-zag angle.

An Elaborate Showcase Display.

The Broadway Department Store, Los Angeles, Calif., covered the bottom of their large counter showcase with a raffia rug. Green foliage covered the rear and sides of the showcase, with a spotlight hidden at the top right rear. This threw a light that resembled sunlight—a great assistance in a dark store. Inside the showcase was the wax figure of a little girl doll in white muslin, sitting on a kiddie car at the centre front with the "sunlight" on her face. At the opposite side was another girl doll, this time in blue muslin. She was manipulating a tripod camera. At her feet was an empty film pack. ERNEST A. DENCH.

ADVERTISING FOR PHOTOGRAPHERS.

A Talk by a photographer of Kansas City, U.S.A., before the Cameracraftsmen of that city at a recent meeting.—Reprinted from "Abel's Photographic Weekly."

Business is like a machine—it will not run of its own accord, but must be driven by some vital force. What steam is to the locomotive, electricity to the motor—advertising is to business.

The mighty force of advertising is creating and keeping alive all our business institutions. Every successful business is backed by advertising. Every business can widen its commercial horizon and swell its profits by advertising.

Also, business is like a plant, it must be nourished or it will die. What water and care are to the plant, advertising and attention are to business. If your business is sick or run down, it needs nourishment—a tonic—give it more advertising.

All advertising is not good advertising, any more than all eggs are good eggs. I have wasted money on advertising, because I did not know the good from the bad. I am going to tell you what experience has taught me about advertising.

Photography is not only a profession but a business. Every man, woman and child in your community is a prospective customer. Rich men, poor men, from bank presidents to labourers; society women to waitresses, boys and girls, even babies. Go after this business with advertising.

I believe that good work is the best advertising. Every good portrait the photographer turns out is for him a lasting advertisement. A satisfied customer will return to your studio, or send some member of his family, or friend, or speak a good word for you.

I believe a street display is good advertising. I have three street entrances to my studio; two on one street and one on another street. At these entrances I have large brass show cases and I keep them filled with fresh, new pictures. In the lower hallways I have other cases filled with pictures, and at all the entrances, on each step on the stairs, I have the words in large display type, "MOORE'S STUDIO." In the upper halls I have other cases filled with pictures, and the rooms of my studio are filled with specimens of my work.

I have a large electric display sign which projects far out over the sidewalk. This sign is so large that it can be read for a good distance in either direction. Passers-by are continually stopping to look at my display pictures, and it would be hard for anyone passing on either side of the street to miss seeing my signs and pictures.

I believe in newspaper advertising. The local newspaper carries my advertisement all the year round, at least once a week, often three or four times a week. In my newspaper advertisements I use pictures of men, women and children—a different picture each time. These pictures are reproduced by an artist at the newspaper office—with the wording "Photo by Henry Moore," so that no one can look at the picture without seeing the name of the photographer. This makes the picture in itself, an advertisement. The pictures are two columns wide, and the little write-up I put under the picture is usually two inches long.

Under a child's picture I make a little statement referring to the value of the child's photograph to its parents, and under the picture of a grown person I write something concerning the appreciation that always follows such a gift to the children, relatives or friends. Under the picture of an elderly person, I have found it profitable to advertise that I would make one photograph free of charge—of any man or woman who had reached the age of sixty years—offering additional copies at the regular price. And as an excuse for making this offer, I mention the fact that old people seldom realise what their portraits mean to their children, or their friends. The people who accept my offer always get my best work, and they seldom order less than three additional copies, and very often a dozen copies.

A personal letter, well written and signed by the photographer, commands the favourable attention of your prospective customer. The letter that is friendly and dignified in appearance, will be read and remembered. Money spent in this kind of advertising is not wasted. I believe that a circular letter, printed on a machine, with a rubber stamp and mailed at the cheapest rate, is a waste of time and money.

I dictate to my typist a form letter that would apply to a certain class of customer. She writes a separate letter to each customer, repeating in the body of the letter the name of the prospect. This adds a personal touch to the letter, and is proof that the letter is typewritten—not printed. Each letter is signed with pen and ink. I employ three typists and keep them going writing individual letters. I could have these letters printed, and names and addresses filled in—saving me person to do the work, but the letters would not show the personal touch, would lack force and real advertising value, and the results would not be satisfactory.

Nowadays most people accept you at your own valuation. It's the same with a piece of postal matter—the value you place on it is shown by the way it's written and addressed. You must make your customer understand that you want his business and are willing to spend time and money to get it. Your customers are apt to figure that if the letter you send them is not worth dictating, and signing, and sending out with a letter-post stamp, it's not worth reading. I have tried both methods and experience has taught me that the more care I take in advertising the better the results. I do not believe in long letters. A short letter tempts even the busiest business man to read it. A long letter, unless of vital importance, is often laid aside to be read later, or tossed into the waste basket.

I do not believe in hand bills, or advertising matter distributed

from house to house. This method of advertising places the mark of cheapness and unimportance on it. I don't care how nicely the advertising is prepared. If you distribute your advertising as if it were of little or no importance, it will be accepted at the low valuation you place on it, but if you post it as a letter it ranks in importance with the regular correspondence, and is given the careful attention it deserves.

You can prepare your mailing list from the telephone book, selecting the names and addresses of the people whose patronage you desire. There are other ways of securing suitable names.

It is required under the law that each birth be reported and recorded at the office of the Board of Health. I have an arrangement with a clerk in that office whereby I am furnished with the name and address of the parents in the event of a birth in their home. For this service I pay two cents for each name. I write the parents a personal letter expressing my good wishes for the baby, and hope that I may have the pleasure of making its first picture.

Also, I have an arrangement with a clerk in the office of the Recorder of Marriages. Very often, within five minutes after the notice of a marriage has been given I have the home address of the bride and groom. Sometimes, if they live out of the city, my letter is waiting for them when they arrive at their home. The letter conveys my best wishes, and an invitation to come to my studio for a sitting.

I have been fairly successful at my profession and in my business, and there are two reasons for my success. First, because I have always tried to make good pictures I have never been fully satisfied with a picture, but always tried to improve on my work. Second, I believe in good advertising, and have patiently and persistently kept at it.

HENRY MOORE.

THE GLOSS CHARACTERISTICS OF PHOTOGRAPHIC PAPERS.

(A Communication from the Research Laboratory of the Eastman Kodak Company.)

IN a systematic study of the characteristics of photographic papers a consideration of the surface quality is of great importance. The most important factors required in the specification of surface quality are colour, texture, and gloss. The colour can be measured by the employment of suitable colourimetric methods, the results being most conveniently specified by stating the diffuse reflecting power, wave-length of the dominant hue, and the saturation. These three factors, which are necessary for the specification of colour, completely define from the subjective standpoint the quality and intensity of the light reflected from the surface.

The word "texture" is used in referring to the topography of the surface. Thus far no simple numerical method of expressing quantitatively the texture of the paper has been developed. At the present time the texture is best studied by examining the surface under a microscope. A magnification of from 10 to 20 diameters has been found to be most suitable for this work. Photomicrographs made with a fixed magnification and under certain specified and constant conditions of illumination are found useful in case a permanent record of the texture characteristics is required.

The third factor mentioned, that is, gloss, is dependent upon the geometrical distribution of the light reflected from the surface under consideration.

In general it may be said that of the light reflected from the surface of such materials a part is diffusely reflected while the remainder is reflected specularly, that is, in accordance with the law that the angle of reflection is equal to the angle of incidence. Considering surfaces in general, it is found that an infinite number of variations in the ratio of specular to diffusely reflected light exists, the scale being theoretically limited at one end by a surface which reflects all of the incident light, according to the law that the angle of incidence is equal to the angle of reflection, and at the other by a surface which reflects light equally in all directions regardless of the angle of incident illumination. The characteristic of the surface referred to by the words "glossy" or "glossiness" is dependent upon the relation existing between the light which is diffusely and regularly reflected from the surface, and it is with the measurement and numerical specification of this factor that this paper deals. It is customary, at the present time, to designate the gloss factor of a photographic paper by the use of such descriptive words or terms as "matt," "semi-matt," "velvet," "glossy," etc. It is evident that the use of the words can only approximately specify the gloss quality, and it is very desirable for the sake of more precise designation to develop a method for the numerical specification of this quality.

The problem of mixed specular and diffuse reflection has been treated at considerable length in the reports of the Committee on Glare[1] of the Illuminating Engineering Society. In these reports Dr. P. G. Nutting, who was chairman of the committee at that time, presented a very complete mathematical treatment of the problem and proposed as a logical specification of gloss the ratio of the specular reflecting power to that of diffuse reflecting power, the illumination being incident normally and the illuminating source of such dimensions as to subtend .01 steradian at the surface. In one of the reports considerable data relating to the gloss of various print papers and to some photographic papers are given.

Taking advantage of the fact that in the case of mixed specular and diffuse reflection the regularly reflected component is almost completely polarised under certain conditions, Professor L. R. Ingersoll[2] has developed a polarisation method of measuring the gloss factor. In his instrument the conditions of illumination both as regards angle and size of source are chosen arbitrarily. Under these conditions, the ratio between the intensity of the regularly and diffusely reflected components is measured by some type of polarisation photometer such as the Martins photometer or the Pickering polarimeter. This instrument provides, therefore, an arbitrary scale upon which the gloss values may be expressed.

The term "gloss" is used as descriptive of the subjective impression received when observing a surface from which light is reflected, and there is little doubt that the degree of glossiness is dependent upon the contrast between the brightness of those portions of the surface which are seen by diffusely reflected light and those which are seen by regularly reflected light. In other words, gloss must be a function of the brightness contrast existing between the more or less clearly defined specular images of light-sources having relatively small angular dimensions and the contiguous portions of the surface which owe their brightness to diffusely reflected light. It seems logical, therefore, that the absolute scale of gloss can be established only by measuring this brightness contrast under certain specified conditions of illumination and observation.

The Gonio-Photometer.

Before deciding upon the conditions under which such measurements were to be made, it seemed desirable to measure the distribution of light reflected from the surface under consideration for various conditions of illumination. This involved the determination of the reflection characteristics of the surfaces for all angles of observations, and under certain specified conditions of illumination.

For this purpose a special instrument termed, for convenience, a "gonio-photometer" was designed and constructed. A diagram showing the essential parts of this instrument is shown in fig. 1.

A heavy cast-iron base, A, supports the arm B, at the end of which is carried the photometric apparatus. In order that the observer and the photometric equipment might not interfere with the illumination of the sample at angles approaching closely to the normal, the axis of observation was bent at right angles by use of the total-reflection prism C. A portable photometer of the illuminometer type was mounted at D; and the small lens E, placed imme-

1. Trans. "I.E.S.," vol. 10, 1915, p. 353, 379 and 388.

2. "J. Opt. Soc. Amer.," May, 1921, p. 213.

diately in front of this photometer, permitted the formation of an image of the surface under examination in the plane of the photometer cube. In case the texture of the surface was such as to interfere with precise photometric settings, this lens could be displaced by amounts sufficient to eliminate the troublesome surface texture. A rigid bearing E supported by the base casting carries a movable arm G, on one end of which is mounted the lamp-house H, while at the other end a counterpoise weight I is placed. A holder is pro-

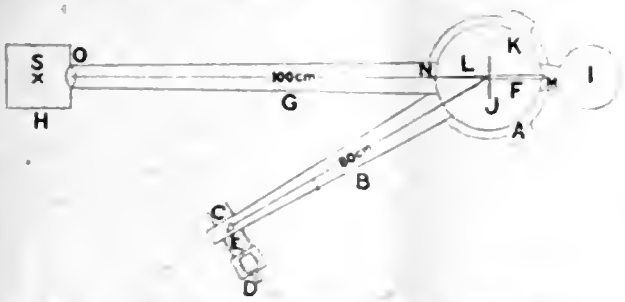


Fig. 1.—Diagram showing essential parts of instrument.

vided for the sample at J; this is so mounted that it holds the surface of the samples being examined in the plane passing through the axis of rotation of the arm G. The circular scale plate K is mounted in a fixed position relative to base A. A pointer attached to the sample holder indicates the angle on the divided circle. By means of a pin M, the sample holder can be connected rigidly with the moving arm G, so that the plane of the sample will remain perpendicular to the incident illumination for all positions, and as the arm G is rotated the angle of observation alone varies. This provides for the measurement of the surface brightness at various angles of observation and fixed direction of illumination. By removing the pin M and clamping the sample holder to the base, A, the arm G moves independently of the sample, and observations of brightness at a fixed angle of observation, but with a variable angle of incidence, can be made. In the front of the lamp-house is mounted a lens O of such focal length that the source S falls at its focus. Under such conditions the light incident on the sample is approximately parallel. The dimensions of importance are as indicated in the figure. It is also so arranged that the lens O can be removed, and in its place substituted a disc of diffusing material, such as ground pot opal glass.

The dimensions are so adjusted that the effective area of this diffusing material is just sufficient to subtend an angle of .01 steradians at the surface of the sample under examination. A 500-watt Mazda C lamp of the concentrated filament type was used as a source for illuminating the samples. A photograph of the apparatus is shown in fig. 2. The voltage was precisely controlled in

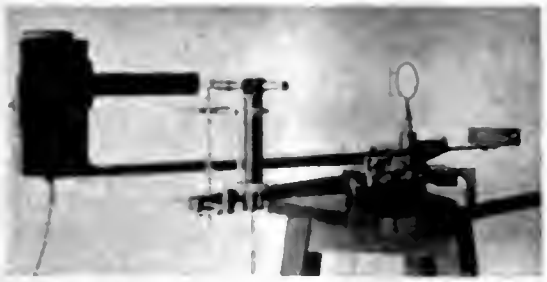


Fig. 2.—Photograph of apparatus.

order to eliminate variations in brightness due to fluctuations in the line voltage. Complete distribution curves of the light reflected were obtained from a series of samples, with the illumination incident on the sample at various angles.

From a consideration of the way in which the average observer adjusts a photograph, which he is examining with respect to the line of sight and the direction of its illumination, it appears that the most favourable and comfortable conditions are obtained when the line of sight is normal to the surface of the print and the illumination incident at an angle of approximately 45 deg. from the normal. Such an adjustment of conditions prevents the observer from being annoyed by specular reflection from the surface in case such exists. In a previous paper[3] this same condition of illumination and observation was adopted as being the most suitable under which to measure the photographic densities of prints and of sensitometric test strips used in the determination of sensitometric constants of such materials. These conditions were chosen as representing most closely the average conditions of illumination under which photographic prints are observed.

From a consideration of the distribution curves and also from a consideration of the way in which a photographic print is usually observed, it was decided that a comparison of the brightness of the surface when viewed normally, and at the angle of specular reflection with the illumination incident at an angle of 45 deg. from the normal, would give a determination of gloss most nearly in accord with the commonly observed value of that factor.

The diagram in fig. 3 illustrates the conditions of illumination and observation which were adopted for the measurement of gloss. The line *MN* represents the plane of the sample under consideration. This is illuminated by a beam of parallel light incident in the direction *AO*. A brightness measurement of the surface is then made in the direction represented by the line *BO*, and this brightness will be designated by the symbol *Bd*. A second brightness determination is made in the direction *CO*, and this value is designated by the symbol *Bs*. Let the curve *KLPR* represent the complete brightness distribution curve of the sample under consideration. It is evident from the shape of this curve that the reflection from this sample is of a mixed specular and diffuse type. It is evident that the value of *Bd* is a measure of the diffuse reflecting power of the sample while the value of *Bs* is a measure

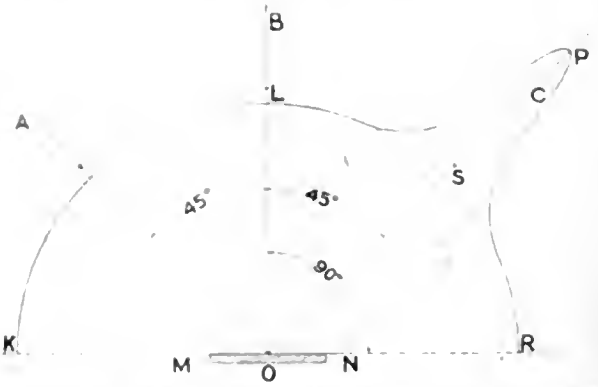


Fig. 3.—Illumination and observation adopted for measurement of gloss.

of the specular plus the diffuse reflecting power of the sample. The brightness (*Bs*) due to specular reflection may therefore be obtained by subtracting *Bd* from *Bs*. That is, $B_s = B_s - B_d$. As previously stated, gloss is a function of the brightness contrast between the more or less clearly defined images of light-sources having fairly small angular dimensions and the contiguous portions of the surfaces which are visible by virtue of light diffusely reflected from them. It is very evident from a consideration of the values obtained in practice that the subjective impression of gloss, or perhaps, more properly speaking, of "glossiness," is not directly proportional to the contrast value. This contrast may, however, be taken as an adequate measure of the physical stimulus producing the sensation of glossiness. It may be convenient to use different terms as representative of the physical aspect or stimulus and the subjective aspect or sensation. Such a procedure will be analogous to the use of "brightness" and "brilliance" in referring to the intensity factor of radiation and the subjective sensation resulting from its action on the retina. In this case the term brightness is used as descriptive of the physical or objective aspect of the stimulus, while the term brilliance is used in reference to the resulting sensation.

It is proposed, therefore, to adopt the term "gloss" as descriptive of the stimulus, while the term "glossiness" will be used in referring to the subjective sensation produced. The experimental results given in the paper relate almost entirely to the measurement of gloss, and while some indication has been obtained as to the relation existing between the stimulus, that is gloss, and the

3. "B.J.," 1921, 9, 22, 38; and "Phot. J.," 1914, 54, p. 342.

resulting sensation, glossiness, the data available are entirely inadequate for the formulation of a definite physical relation between the stimulus and the sensation. The distribution curve of a surface having zero gloss is represented by the curve *KLSR* and for such a case $Bd = Ba$ and $Bs = 0$. Gloss (G) may therefore be defined by the equation

$$G = \frac{Bs}{Bd} = \frac{Ba}{Bd} - \frac{Bd}{Bd} = \frac{Ba}{Bd} - 1 .$$

On the basis of this definition, the scale of gloss extends from zero, for a surface which reflects light equally in other directions, that is, one obeying Lambert's cosine law, to infinity for the surface from which the reflection is entirely specular.

It will be recalled that in the reports of the Committee on Glare (loc. cit.) it was recommended that a source of such dimensions as to subtend .01 steradian at the sample be used in the measurement of gloss. The practical objection to this procedure is that under such conditions it is difficult to obtain illumination on the sample sufficiently high to give a field brightness in the photometer which will result in high precision and absence of fatigue in reading the instrument. In order to determine the magnitude of the difference in the measured gloss values when using this type of illumination and that obtained by using a beam of parallel light, a series of measurements were made. A group of samples varying from very high to very low gloss were chosen, and the gloss values of the group determined with both types of illumination. The results, which will be given in detail later, show that when illuminated with a collimated beam the gloss values ranged from .43 to 24.0, while with a source subtending .01 steradian the values varied from .36 to 12.4. This indicates that the use of collimated illumination provides a more extended gloss scale, thus permitting the measurement of smaller differences in gloss than could be measured when the source subtends a larger angle. For these reasons it was considered advisable to specify that gloss measurements be made with the sample illuminated by parallel light. While it is quite possible to make gloss determinations by using the goniophotometer, this requires two individual photometric readings, one made with the direction of observation normal to the surface and one at 45 deg. from the normal. Although this method is satisfactory, it is not suitable where a very large number of samples are to be examined, nor does it afford the precision required for the comparison of samples differing but little in gloss.

The Gloss Meter.

The best conditions of illumination and observation having been determined from an analysis of the results obtained with the goniophotometer, an instrument for the direct measurement of gloss was designed and constructed. A schematic diagram of this instrument is shown in fig. 4.

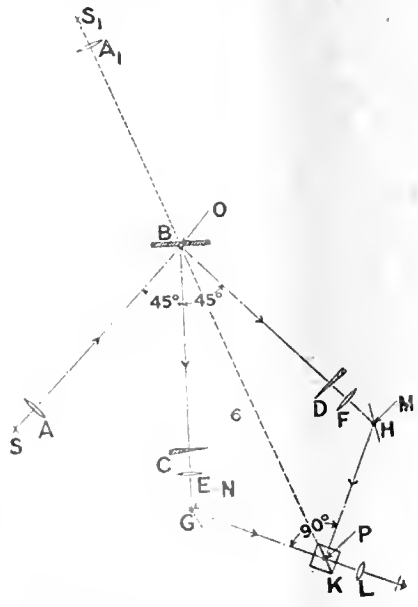


Fig. 4.—Schematic diagram of instrument.

The light-source is placed at the focal point of lens A, which is a well corrected telescopic objective. The light-source used is a tungsten lamp having a highly concentrated filament, thus approaching as closely as possible to a point source. The collimating beam is incident upon the sample B at an angle of 45 deg. from the normal. The lenses E and F placed respectively on the normal to the surface and on the line at 45 deg. from the normal form images of the sample B in the photometer cube K. The focal length of these lenses and the distances are such that the images are of unit magnification. The mirrors G and H properly placed serve to reflect the beams of light as indicated so that they intersect each other at an angle of 90 deg. in the photometer cube. The photometer field is viewed through the lens L with an eyepiece of the type commonly used for such work. The brightness of the two images formed by the light leaving the surface normally and that formed by the light leaving at an angle of 45 deg. can be varied by means of the neutral tint wedges C and D. The zero of the instrument is set by replacing the sample by a piece of pot opal glass so placed that the line *OP* which bisects the angle *NOM* is normal to its surface. This is illuminated by swinging the light-source with its collimating lens into the illuminated normally with a beam of parallel light, and images of this surface are formed in the photometer cube by light which leaves the surface at equal angles on the opposite sides of the normal to the surface. With the scale which is attached to the neutral wedge D set at zero, a photometric balance is made by adjusting the position of the neutral tint wedge C; this adjustment having been made, the light-source is returned to the position for the illumination of the sample as designated by the letters S and A. The sample to be examined is then placed in position B, and a photometric balance made by moving the neutral tint wedge D. This gives a direct measurement of the relative brightness of the surface as viewed normally and at the angle of specular reflection. The scale carried by the wedge D may be calibrated either to read the ratio of these two brightnesses or, if desired, to read directly in gloss values. In the case of some surfaces having a marked texture, it may be found difficult to make precise photometric settings when the image is focussed in the photometric cube. By displacing slightly the lenses E and F the sharp focus can be destroyed and this difficulty overcome.

Loyd A. Jones.
Milton F. Fillius.

(To be continued.)

FORTHCOMING EXHIBITIONS.

April 4 to 19.—Royal Photographic Society. Prints by Dr. H. B. Goodwin. Open daily from 11 a.m. to 5 p.m. 35, Russell Square, London, W.C.2.

April 21 to May 11.—Hammersmith Hampshire House Photographic Society. Particulars from the Hon. Exhibition Secretary, J. Ainger Hall, 26, Bishop's Mansions, Bishop's Park Road, London, S.W.6.

April 22 to May 27.—Royal Photographic Society. Colonial prints arranged by "The Amateur Photographer and Photography."

May 1 to 6.—Photographic Fair. Horticultural Hall, Westminster. Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1.

June 1 to 30.—Royal Photographic Society. Prints by Pirie MacDonald, of New York.

September 9 to October 7.—London Salon of Photography. Latest date for entries, August 30. Particulars from the Hon. Secretary, London Salon of Photography, 5a, Pall Mall East, London, S.W.1.

September 11 to 15.—Professional Photographers' Association, Princes Galleries, Piccadilly, London, W. (Trade and Professional). Hon. Secretary, Richard N. Speaight, 157, New Bond Street, London, W.1. Also foreign invitation loan exhibition of professional portraiture. Hon. Secretary, Marcus Adams, 43, Dover Street, London, W.1.

September 18 to October 28.—Royal Photographic Society. Latest date for entries by carrier, August 25. Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, March 27 to April 1 :—

ENLARGING APPARATUS.—No. 8,951. Photographic enlarging apparatus. E. A. Green.

SHUTTER MECHANISM.—No. 9,188. Shutter mechanism for photographic cameras. T. Litchfield.

CAMERAS.—No. 9,191. Photographic cameras. T. Litchfield.

TRIPODS.—No. 9,030. Tripods, etc., collapsible stands. H. Ranson.

FILMS.—No. 9,457. Securing strip of photographic film in flat coil for treatment by liquid. Correxmüvek Filmipari Gepgyar C. Lazlo.

SURVEYING.—No. 8,919 Photographic surveying. J. W. Gordon.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

SILVER-IRON SENSITISERS.—No. 175,317.—(August 20, 1920). In Patents 9,993/1902 and 9,855/1907, were described photographic emulsions containing silver phosphate in the insoluble form. According to the present invention silver phosphate is used in dissolved form, *i.e.*, paper is sensitised by the use of a solution of silver phosphate and the ferric salt of an organic acid, and may be developed by the alkali salt of an organic acid.

Such solutions of silver phosphate may be prepared by treating either the orthophosphate, meta-phosphate, or pyro-phosphate of silver, especially when freshly prepared, with a sufficient quantity of ferric salts of organic acids, more particularly ferric oxalate or citrate which must be free from the corresponding ferrous salt. The ortho-phosphate readily dissolves in a solution of such salt at ordinary temperature, but the pyro-phosphate and meta-phosphate require to be heated to about 50 to 60 deg. C.; possibly the pyro or meta-salts are converted into the ortho-phosphate prior to or during solution. In any case the solutions so obtained appear to represent either true or colloidal solutions of silver phosphate.

The silver phosphate, preferably in the freshly prepared form, *e.g.*, the product of double decomposition, is then treated with a solution of the ferric salt of an organic acid, preferably ferric oxalate which appears to be the most satisfactory, when a solution is obtained which is found to be capable of preservation in the dark for prolonged periods while still remaining photographically perfect.

Such solutions under whatever conditions they may have been prepared appeared always to possess the same speed and gradation and to produce the same tone provided the nature and the proportions of the components are unchanged.

The sensitising solution so obtained may be treated to increase its viscosity, *e.g.*, by mixing the finished solution with suitable colloids such as solutions of gelatine, gum-acacia, or the like, but these colloids must not be added during the process of preparing the silver phosphate. Albumen must not be mixed with the solution as it is coagulated thereby, and if it is necessary to employ albumen in the manufacture of the paper, the materials to be sensitised must be coated first with plain albumen and dried before sensitising by the solution.

After exposure, the print is developed by treatment with an alkali salt of an organic acid preferably the alkali salt of the acid present in the ferric salt.

It appears that when sensitised material prepared from the above solution is exposed to actinic light, two different photochemical actions are produced, viz., the ferric salt is reduced to ferrous salt in proportion to the amount of light received and the silver phosphate, which possesses all the properties required for the production of a perfect image, is, at the same time, affected also in proportion to the amount of light received. Now when the reaction has taken place, the ferrous compound produced will act as a developer for the silver compound in presence of the alkali salts of the organic acid, and it will be seen that the amount of the developer is automatically proportionate to the amount of exposure which has taken place.

The invention is illustrated by the following examples; the operation should be carried out in yellow light or taking other precautions to exclude actinic light.

A.—SENSITISER WITHOUT COLLOIDS.

(1) Place 30 gms. of ferric oxalate (stales) free from proto-salt in a suitable vessel, add 100 ccs. of distilled water, stand the whole in a boiling water bath, and, stirring or shaking from the start, leave it there till all has dissolved. Remove from water bath, let cool to ordinary temperature and filter through pure paper.

(2) Into a glazed porcelain or earthenware dish (mortar) place:

4.8 gms. silver nitrate.

2.3 gms. sodium phosphate ($Na_2HPO_4 . 12H_2O$).

70.0 ccs. distilled water of ordinary temperature.

Rub up with pestle until the salts have dissolved, and the yellow silver phosphate has settled out.

Then add to the contents of the dish, 70.0 ccs. of the iron peroxalate solution 1 at ordinary temperature and rub up with pestle till the silver phosphate has dissolved, add

(3) 3.0 gms. of citric acid (powdered crystals, free from lead) rub up till the citric acid has dissolved, filter through pure paper. Preserve in glass-stoppered bottles of deep yellow glass in the dark.

B.—SENSITISER WITH A COLLOID (GELATINE).

If an addition, *e.g.*, of gelatine be required, proceed as follows: Make up the filtered sensitiser exactly as described above, but instead of the 70 ccs. of distilled water prescribed for preparing the silver phosphate (No. 2 of Example A), use only 30 ccs. In the 40 ccs. of distilled water remaining, soak and afterwards dissolve at about 30 to 40 deg. C. the desired amount, say 4 gms., of medium photographic gelatine, add the filtered sensitiser to the warm gelatine solution, well agitating during addition, and finally filter the mixture through absorbent cotton or other suitable material. The concentration of the gelatine sensitiser will then be exactly the same as that of the sensitiser without gelatine described above.

This gelatine sensitiser remains liquid at temperatures above 10 deg. C. It is evident that sensitisers with any other suitable colloid may be prepared by simply substituting the gelatine of the above example by such colloid.—York Alexander Ferdinand Schwartz, 14, Park Parade, Harlesden, N.W.

STEREOSCOPIC PROJECTION.—No. 175,930 (June 21, 1921). The invention relates to the analyser for viewing projected stereoscopic pictures.

It is, of course, necessary that the movements of the shutter in such analysers shall synchronise with the appearance of the views on the screen, and this is effected by pneumatic means, in such manner that the movement of the analyser shutter is controlled by the movement of the lantern shutter or in the case of a cinematograph projector by a moving part thereof, so that the left eye sees one picture and the right eye sees the complementary picture immediately afterwards. These two pictures being coalesced, by the persistence of vision, produce on the retina of the eye the impression of a single picture in stereoscopic relief.

The analyser is conveniently made in a form somewhat resembling a pair of opera glasses mounted on a frame and supported in the centre by a handle, the two eyeholes being provided with, or being without, lenses and a shutter or shutters operated to alternately cover these openings.

Fig. 1 shows somewhat diagrammatically the construction of an analyser as worked by pneumatic means alone, and fig. 2 shows part of an analyser constructed to work by pneumatic means in conjunction with electricity.

The shutter *a*, fig. 1 is attached to a rod a^1, suitably pivoted at *b*, so that it can be reciprocated quickly back and forth over the eye openings *c* and c^1 on frame *d*, in order to alternately uncover and cover these two openings, the shutter device being adapted to be reciprocated by pneumatic means.

One way in which this can be effected is by providing the instrument with a small conical, cylindrical or otherwise shaped box *e*, containing a diaphragm *f* of thin rubber. The top part of this box, also the diaphragm, would be open, in order to give free access to the atmospheric pressure, also to allow the rod *g* to pass from the centre of the diaphragm, where it would be attached to the crank and pin *h*, for the purpose of connection. The lower part of the box beneath the diaphragm would be closed, except that a metal tube *i* would pass from the bottom of the box through the handle *j*, so that a rubber tube *l*, preferably armoured, could be easily attached. This rubber tube would lead to a pneumatic impulse-generating device, through

which, in conjunction with valves, periodic impulses would be transmitted to actuate the diaphragm and by suitable rod connections and gearing, also the shutter of the analyser in synchronism with the pictures.

An electro magnet *m*, as shown in fig. 2, may be attached to the analyser, which would be so placed that it could act upon armature *n* when the electric current is in circuit, which armature would also act as a valve and be a part of the valve shown at n^1. Immediately this valve was opened, the air would pass through inlet *o* and thence through *p* and tube *q* to the diaphragm box *e* and force diaphragm *f* upwards, and by means of suitable connections the shutter would move, say to the right, and immediately the electric circuit was broken the spring *r* would pull the armature back again and so close the portion of the valve *n* and at the same time open the portion of the valve at n^1, consequently letting the air contained in the diaphragm

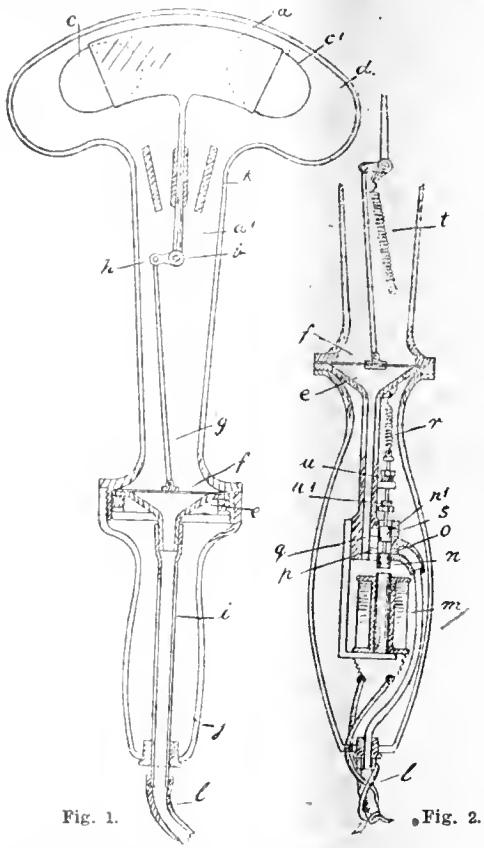


Fig. 1. Fig. 2.

box escape through the exhaust *s*. The air pressure being thus cut off, the diaphragm with the assistance of the spring *t* would drop, or be forced down again, and the shutter would be pulled to the left.

Two rubber stops *u* and u^1 (fig. 2) are employed to prevent the poles of the electro magnet and armature touching and the arrangement and manner in which the air tube and wire leads pass out through the handle of the analyser is shown at *l* fig. 2.

The electric current for exciting the magnet and attracting the armature would be controlled by means of a commutator, or make and break device which would be attached to some suitable working part of the projector, or in case of still life projection to the shaft carrying the revolving shutter placed before the double lantern. The electric leads could run along the connecting tubes, and so reach the analyser.

In the case of an exhibition of sterenscopic pictures more than one analyser may be used at the same time, it only being required to make the necessary tube or wire connections so that the movements of the diaphragms (or the diaphragms and armatures) of the individual analysers are all effected and controlled from the lantern or projecting apparatus.—Arthur Norton Wright, 26, Court Road, West Norwood, London, S.E.

The following complete specifications are open to public inspection before acceptance :—

Photographic Machine.—No. 177,537. Photographic machine. E. Zoffinger.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

Kodak (Design).—No. 420,930. Photographic papers. Kodak, Ltd., Kodak House, Kingsway, London, W.C.2, dealers in photographic materials. November 25, 1921.

MARKS PLACED ON THE REGISTER.

The following marks have been placed on the register :—

Desium.—No. 414,023. Light filters for cinematograph projectors. David Kennedy, 215, Selhurst Road, South Norwood, London, S.E.25, manufacturer.

N. G. (Device).—No. 412,035. Philosophical instruments, scientific instruments, and apparatus for useful purposes; instruments and apparatus for teaching. Nitsche & Gunther Optische Werke, 4-5, Dunckerstrasse, Rathenow, Germany, manufacturers of scientific and optical instruments.

Teddy.—No. 415,931. Photographic cameras. Edmond Francis Stratton, 1, Cedar Street, South Norwalk, State of Connecticut, United States of America, manufacturer.

Wellington Speedy (Design).—No. 412,492. Photographic dry plates. Wellington & Ward, The Elms, Shenley Road, Boreham Wood, Elstree, Hertfordshire, manufacturers.

Zenith.—No. 417,425. Chemical substances used in photography, photographic plates and photographic films included in Class 1. Ilford, Ltd., Britannia Works, Roden Street, Ilford, Essex, manufacturers of photographic plates, paper and films.

Bayrapid.—No. 417,364. Chemical preparations for photographic purposes. Farbenfabriken vorm. Friedr. Bayer & Co., Leverkusen, near Cologne-on-the-Rhine, Germany, manufacturers.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Monday, April 17.

Forest Hill and Sydenham P.S. Annual General Meeting.
Glasgow and W. of Scot. A.P.A. Show of Members' Autochromes.
Hammersmith Hampshire House P.S. Outing to Dorking.
Walthamstow P.S. Jumble Sale and Members' Lantern Evening.

Tuesday, April 18.

Bournemouth C.C. "Carbro Process." A. Dordan Pyke.
Cambridge Phot. Club. "How a Reflex Camera is Made."
Rochdale P.S. "Pictorial Ideals." M. O. Dell.
Stalybridge Phot. Soc. "Platinotype and Satista."

Wednesday, April 19.

Croydon C.C. "Platinotype in a Test Tube." J. W. Purkis.
Dennistoun A.P.A. Impressions of the Salon.
Edinburgh Phot. Soc. "Passe Partout." W. Coghill. Also Lantern Slide Competition.
Ilford P.S. Affiliation Folio.
Partick Camera Club. Jumble Sale. (Half Profits.)
Rochdale A.P.A. "Sulphide Toning." T. Crabtree.

Thursday, April 20.

Gateshead C.C. "Some Hints in Photography." R. Wilson.
Tunbridge Wells A.P.A. "The Evolution of our Local Scenery." H. E. Turner, B.A., B.Sc.

Friday, April 21.

R.P.S. (Pictorial Group). Discussion—"The Negative, the Print, and the Picture."
Ilford Phot. Soc. "Bromide Toning." P. S. Brown.

CROYDON CAMERA CLUB.

Quite one of the most enjoyable evenings of the session was afforded by Mr. G. H. Gardner with a lecture on "Photography and Crime," a two-sided subject, he said, both aspects doubtless being, more or less, familiar to his fellow members.

Photography was largely employed by a certain class of malefactors who were not necessarily of the pictorialist order, and the same craft rendered invaluable service in the detection of crimes and their perpetrators. As methods improved so the habitual criminals endeavoured to defeat them—a sort of "gun *versus*

armour-plate" contest, quite a nice game played slowly. Consequently he proposed to refrain from describing any procedures a knowledge of which might be helpful to the enemies of society.

Of considerable utility in training the powers of observation were portraits, which were largely used in the education of recruits to the police force. Although it might not seem so, really accurate descriptions from memory of facial characteristics were very difficult.

Following came a sketch of the photographic department at Scotland Yard, evidently thoroughly up-to-date and complete in all respects, and a brief allusion to the many scientific and highly ingenious methods in use. Next, a full consideration of the finger-print method of identification, and the really wonderful system by which finger-prints of suspected persons can be quickly identified with their counterparts if in stock. The lecturer then appropriately asked the President thus to record himself. "Don't do it unless you want to be on the file at the Yard," excitedly warned the "office boy." "The records are probably there now, along with yours," sadly observed Mr. Gardner.

In the discussion Mr. Ackroyd inquired what was the lecturer's opinion of "Sherlock Holmes"; whether any steps had been taken by Scotland Yard to disguise policemen's boots; and if it were not true that the guardians of law and order were under considerable obligations to "narks."

Mr. Gardner replied that as the originator of the Sherlock Holmes happened to be a personal friend, he would content himself by saying that this remarkable character in fiction resembled an ideal photograph—one heard of, but never seen. Policemen now bought their own boots. "Narks," certainly, were very useful at times.

Mr. Walker, referring to a chart issued by the Yard during the war showing the probabilities of future air raids day by day, asked if copies were publicly distributed. "They were sent to all police stations," answered the lecturer. "I never saw one," indignantly exclaimed Mr. Walker.

During the evening a pleasant letter of partial farewell from Mr. Catharine was read, expressing gratitude for the happy times he had spent in the club, and the useful information acquired on many subjects, including photography. Escaping once a week from the depressing artificiality which pervaded Suburbia, to a community where a man could call another a blithering ass in a spirit of pure friendship, had been a welcome relief. It is understood that Mr. Catharine has joined the R.P.S. as the London society best suited to his needs.

EDINBURGH SOCIETY OF PROFESSIONAL PHOTOGRAPHERS.

Meeting held at 116, Hanover Street, Edinburgh, on Monday, April 3. Present: Mrs. MacKay, Mr. J. Campbell Harper, Mr. Norman Thomson, Mr. W. B. Hislop, Mr. E. D. Young, Mr. Ferguson, Mr. Aikman and Mr. Swan Watson. Mr. J. Campbell Harper, the President, in the chair.

Apologies for absence were intimated from Mr. J. B. Johnston, Mr. P. S. Moffat and Mr. George Balmain.

The President, one of the visiting committee to Mr. Hislop's Class on Optics and Practical Chemistry at Boroughmuirhead School, stated that after his visit on the 7th ult. he should have liked very much to have been present at every one of Mr. Hislop's lectures. He considered that Mr. Hislop's methods of teaching were of a very high standard, and his ability and business capacity enabled him to deal with the subject in the most effective manner possible. The students appeared to be exceedingly interested, and altogether the class impressed him as being well conducted and most instructive. Mr. Swan Watson, another member of the committee, stated he had only unqualified praise to speak of the lecturer, whose lectures came to him as a great revelation. He had attended a number of the lectures, and throughout the instruction had been intensely interesting, lucid and of a very high standard. He thought that the Society owed Mr. Hislop a real debt of gratitude for the time and trouble which he devoted towards these lectures. Mr. Hislop stated that owing to lack of time and pressure of other business he regretted he could not undertake the tuition of the class for next session. He thought it might be an excellent opportunity for a professional photographer to take it up. He further stated that he understood the Heriot-Watt College authorities had serious intentions of re-starting classes for process engravers next session, in which event he suggested that the Society should endeavour to get the class for optics and chemistry conjoined with these as an elementary class. He personally preferred the classes run by the Heriot-Watt to those of the Education Authority, as the student who attended the former got every consideration, and the Heriot-Watt College had more appliances and working utensils for demonstrating lectures. Mr. Hislop's resignation was received with much regret, and he was at once asked to re-consider his decision. Mr. Hislop, in view of the unanimous and hearty feeling of the meeting, undertook to re-consider the whole matter and write a report for the next meeting.

Mr. E. D. Young stated that he had been informed by the Secretary of the College of Art that any apprentices who wished to attend the classes conducted by Mr. Hislop at Boroughmuirhead School and by him at the College of Art on applying in June next to Mr. Arthur Butler, Edinburgh Educational Trust, Castle Terrace, Edinburgh, would have their fees paid, and also a certain sum would be allowed to the College for each apprentice for working utensils for the classes.

It was unanimously agreed to grant a donation of £1 1s. towards the prize fund of the retouching class at the College of Art, and the Secretary was authorised to pay the same.

The Secretary read a letter from Mr. T. Black, Secretary of the Glasgow and District Professional Photographers' Golf Club, addressed to Mr. George Balmain, suggesting May 12, at Glasgow, for the golf match between the Societies. It was agreed to accept the date mentioned.

The President and Mr. E. D. Young reported that on March 16 last they went as a deputation from the Society to Glasgow to discuss with a committee of their Glasgow brethren the proposed Federation and the holding of a Scottish Congress. The Glasgow Committee agreed to a Federation being formed, and it was proposed that draft schemes be prepared by each Society and thereafter a joint meeting be held. It was agreed that subscriptions for a country member to either society should not be less than 10s. per annum. This joint meeting of committee had been fixed for Friday, April 21, in Edinburgh.

The Committee of the Glasgow Society approved of the holding of a Congress in Edinburgh in 1923, and recommended that they should collaborate with their Edinburgh brethren on the subject. Questions of how much would be required to run such a Congress were discussed, and it was remitted to the Federation Committee for consideration and report.

Mr. Fergusson and Mr. Yerbury were co-opted members of the Committee, and it was resolved that the Society entertain the Glasgow Committee, who are coming to Edinburgh on the 21st inst.

The meeting thereafter considered the formation of a Federation between the Edinburgh and the Glasgow and District Professional Photographers' Societies, in order that professional photographers throughout Scotland may become directly interested in the activities of the profession. Various theories were put forward and discussed in detail, and it was suggested that a circular should be prepared, setting forth the aims and objects of the Federation and the benefits to be obtained by professional photographers joining one or other of the societies to which they would be allocated. It was resolved that Scotland and the North of England be subdivided into two parts, and that professional photographers in the provincial towns be invited to join the society allocated to it; that the societies form a Federation and each society appoint a joint committee to manage the affairs of the Federation; that each society contribute to the Federation a fixed sum per member towards the funds of the Federation, to be applied towards propaganda work, exhibitions and lectures. It was proposed to suggest this scheme to the Glasgow Committee at the meeting on the 21st inst. and thereafter continue the discussion.

A vote of thanks to the President terminated the proceedings.

LANCASHIRE SOCIETY OF MASTER PHOTOGRAPHERS.—The Society is holding its annual meeting and conference at Blackpool during the Trades' Exhibition there from May 15 to 20. All professional photographers in the North of England and in Scotland will be invited. Special facilities will be provided for exhibitors, since the promoters have taken over from the Blackpool Trades' Exhibition the whole of the stands for the week, together with the electric lighting and other equipment. Particulars from the secretary, Mr. W. H. Hulsh, 39, Blackfriars Street, Manchester.

News and Notes.

Mr. A. S. Ray, who is very well known in photographic circles, and who for many years has represented Mr. T. K. Grant for the Lumière products in this country, has just joined Messrs. Griffin's as representative in the northern part of England and in Scotland.

Mr. George J. Hughes, formerly of Waterford, and now established at Bridge-of-Allan, sends us an attractively printed booklet of reproductions of his artistic work in portraiture and also in landscape. Among them are works which have won awards in notable open exhibitions.

Avoid Printing Failures.—Under this title Messrs. Griffins, Kemble Street, Kingsway, London, W.C.2, have just issued a free instruction booklet dealing with the making of prints on their "Noctona" (gaslight), "Goldona" and bromide papers. The booklet contains many practical hints, and also formulæ for brown, blue and green tones on "Noctona."

Hand Cameras at Lower Prices is the title of a 72-page list just issued by the City Sale & Exchange, 81, Aldersgate Street, London, E.C.2. In the preparation of this closely printed catalogue of a part of the firm's large stock regard has been paid to the reduction in prices, which are now on a considerably lower level than at the corresponding time last year.

A Few Wise Words from Wellington.—A spring booklet from Messrs. Wellington & Ward announces in an appropriately lively vein some forthcoming introductions from the famous Elstree firm, including the twelfth edition of the well-known Wellington Handbook, which will contain an additional chapter on cameras, a revised article on the Bromoil process, and will be illustrated in photogravure.

Self-Desensitising Plates.—According to a patent No. 175,296 (applied for but not yet accepted) in the name of K. Wiebking, Weissenburg, Germany, to the back of a sensitive plate is applied a coating of gelatine, gum arabic, or isinglass containing safranine or other desensitiser which is soluble in the developing solution. This enables the development of the plate to be completed in a pale yellow light. An anti-halation medium such as manganese dioxide may be included in the coating.

Westminster Photographic Exchange.—A 56-page price list of cameras and other apparatus has just been issued from 111, Oxford Street, London, W.1, and represents a systematic marking down in the prices of the whole stock held by this leading firm of dealers in second-hand photographic requisites. The list fully describes a very great number of hand cameras of all types, and, moreover, offers a large variety of lenses and miscellaneous accessories. Obtainable free on application to the address given above, or to the other establishment of the Westminster Exchange at 119, Victoria Street, London, S.W.1.

Boat Race Photographs.—The many professionally-made photographs of the Oxford and Cambridge Boat Race this year were, as a whole, very much better than those taken in previous years, particularly the cinematographic renderings. Many photographers were given special facilities this year, and operators belonging to one firm were allowed to have their cameras on the two University launches which accompanied the umpire's launch. This is the first time these launches have been allowed so near the actual boats, and the result is practically a "close up" of the crews from start to finish. In the past cinema cameras had to be content with precarious perches on bridges or stations on the banks.

Wiggins Teape and Co.—The directors of Wiggins Teape and Co., Ltd., have concluded a provisional agreement with Mr. F. D. Pirie, acting on behalf of the ordinary shareholders of Alex. Pirie and Sons, Ltd., whereby the former company is to acquire up to 600,000 consolidated ordinary shares of £1 each in the capital of Alex. Pirie and Sons, Ltd., at the price of 16s. 8d. per share, to be paid and satisfied wholly in fully-paid £1 ordinary shares taken at their nominal value. This will effect an exchange of shares in the proportion of six shares of the Pirie Co. for five shares of Wiggins Teape and Co. To give effect to the arrangement it will be necessary for Wiggins Teape and Co. to increase its capital of £2,000,000 by the creation of 500,000 additional ordinary shares of £1 each.

Eye-Training with the Camera.—Criticising some statements made in the "Daily Chronicle" by a writer on art matters, Mr. Gordon Ivey, in a letter to the Editor, says: "There are two points of view: (1) To 'see' because one has one's eyes open and anything visible will naturally be recorded in a very elementary and temporary fashion; and (2) to 'see' with the eye of constructive critical observation which records itself permanently in one's mind. The latter requires interest, appreciation of art, and sympathetic understanding of the blending of light and shade to form contrast: this can be acquired by anybody who will just use his eyes. If one feels that he cannot cultivate the 'seeing eye,' let him go in for photography, that will compel the eyes to 'see.'"

The "Weekly Dispatch" Competition.—Professional photographers appear to be doing well in this competition, in which good cash prizes are offered weekly for "mother and child" photographs, prizes going to the subjects as well as the photographers who make the pictures, and special show-cards for window-display are issued to professional workers. Judges award the prizes each week, and at the end of the 16 weeks during which the competition lasts, a committee will select from the weekly prize-winners twelve competitors whose photographs make the prettiest, healthiest and most appealing pictures, and readers will be asked to vote upon them for the award of a first prize of £100, a second of £25, and a third of £10. Entries are also invited to a further competition for the best photograph of a child taken with one of its grandparents. For this a weekly prize of £2 2s. is offered, and at the end of the competition a final prize of £10. The names of several well-known workers have already appeared in the prize lists.

Correspondence.

*** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

THE NEED IN PICTORIAL PHOTOGRAPHY: AN ACADEMY.

To the Editors.

Gentlemen,—I feel a few words of appreciation of Mr. Tilney's recent paper ("B. J.," March 31, 1922) will help to strengthen his statements on pictorial photography. He has put his case in a very strong fashion, and I am prepared to support most of his statements, all but the dramatic remark of his isolating himself in a wilderness; that is more funny than true. Surely, Mr. Tilney has lived long enough to find a few men as wise as himself; men who have been preaching the same gospel of art, men who not only have preached by words, but by works, many of whom have accomplished much for the pictorial side of photography. One of the best men who ever uttered a word in support of pictorial photography was our esteemed friend, the late Snowden Ward; his words and examples still live, and he led many a man to realise the right proportion of the picture.

I quite agree with Mr. Tilney that the bulk of the works now produced are bad, and the workers go blindly on copying and repeating the same mistakes, applying the methods that are absolutely wrong from beginning to end.

I contend that to fully realise the power of the photographic process in art there will have to be established a proper school or academy for teaching under well-organised conditions by men who know, and there seems to me only a few men in England who possess the gift of the real outlook; men who are seriously convinced of the truth of seeing correctly and have the capacity of reproducing these truths to paper. I personally feel that several of these men can top the average portrait painter of to-day. Photography will eventually occupy its rightful position in art, but the strange thing is the professional of the future is not being created in the studios of to-day; the leaders of the art will issue from quite a different source. I am convinced the public are learning, and learning to appreciate the good things even faster than the studio man is himself, and I contend that before many years half the studios of to-day will be closed, whilst new individual workers will rise, men of good, solid knowledge of art and all the details

required to produce one thing. This change is serious on the one hand and a welcome sign on the other; what is required is the Association to be so strong that it will be able to help the profession over the change.

Many of the new workers are much too freakish and fickle to last; there is too much evidence in their work of cheap copy without personal knowledge as to the why and wherefore. Mr. Tilney is quite right in most of his teachings, and it will pay all photographers to read and re-read his article until the dawn of the new light grips every man of the profession.

The serious questions for every studio man to ask himself are:—Where did we start from? What are we doing now? Where are we drifting? Then let us assemble our ideas into a solid form and with the Talbot Fox fund let us establish the Academy in memory of our great founder.—Yours sincerely,

MARCUS ADAMS.

43, Dover Street, London. April 4.

PRESENT-DAY TECHNICAL QUALITY.

To the Editors.

Gentlemen,—I was interested in your leading article of April 7, which appeared to me to represent here and there a school of thought in photographic technical matters considerably different to that to which I and some others belong.

The following quotations from the leader indicate this difference:—

(*a*) "With correct exposure, development becomes a simple task, and the necessity for a number of special printing papers to compensate for bad negatives is almost entirely eliminated."

(*b*) "There is a mischievous doctrine that certain classes of negative are required for different printing processes, and this has been the cause of much poor work."

(*c*) "What might be called a good negative is one which can be printed successfully by any process, etc., etc."

I hope that the meaning of the quotations has not been mutilated by their removal from the context.

Admittedly the correct exposure of the plate is as essential to-day when there are many printing processes available as it was in the days gone by when only a few printing papers were known. The "badness" of a wrongly exposed plate cannot be compensated for in printing. But I, recently, and many others before me, have preached that the quality conferred upon a negative by development is that of "contrast," meaning by that term the magnitude of the range of light-intensities which it transmits during the act of printing. I believe it to be a fact that different printing processes do require varying ranges of light-intensities in order to produce the same results, and that given appropriate negatives all printing papers can be made to yield exactly the same result, the colour of image and the character of the surface excepted. If this be true, and the truth thereof can be readily established by simple experiments, it follows that:—

(1) Development is the difficult task of fitting the range of the negative to that of a particular paper—a contradiction of "*a*."

(2) Negatives of different "contrast" are required for different printing processes—a contradiction of "*b*."

(3) A negative, no matter how good, will yield different prints with different printing papers because of the different properties of those papers.

With regard to (3) I am aware that occasionally a negative is produced which will yield a pleasing result upon several different printing papers. Nevertheless, the prints are different in appearance and they remain equally pleasing because the type of subject is such that the several renderings are agreeable. The virtue is in the subject and not the negative. Can it be seriously suggested that a negative can be so excellent in technical qualities that it will both yield a good print on vigorous gaslight paper and P.O.P., or be capable of yielding similar prints on platinum paper and in gum printing?—I am, yours very truly,

B. T. J. GLOVER.

Sunnymere,
Birkenhead Road, Meols,
April 8, 1922.

[As stated in the first few lines of our article, the notes on development and printing papers related to portrait work, and perhaps we should have said, to commercial portrait work. While we cannot deny Dr. Glover's theorems Nos. 1, 2 and 3, we still hold the opinion that within the scope of work to which our article referred negatives may be made which for practical purposes print equally well in such different printing media as P.O.P., bromide, gaslight, platinum and carbon. We say so because we have used many such negatives in these different media; in fact have made them. So far as we can discover, the versatility of such negatives is not accounted for by the accepted sensitometric doctrines, in regard to which the fault plainly lies with the doctrines and not with the negatives.—EDS., "B.J."]

EQUIVALENT PLATE-SPEED NUMBERS.

To the Editors.

Gentlemen,—I was very interested in the article on plate-speed numbers in the current "B.J.," and quite agree with you that anyone who, like M. Clerc, seeks to express the relationship between the different systems of plate-speed rating is attempting a very difficult task.

M. Clerc has arrived at certain comparative figures, which are supposed to represent the same plate speeds under the different systems in vogue, but do they? The German and Austrian systems do not concern us, but the H. & D., Watkins and Wynne systems do concern us very much, because they are all used by English plate makers. The H. & D. numbers appearing upon plate packets to-day do not agree at all with M. Clerc's table—in fact, they are practically double for the Watkins equivalent. That is to say that a plate of Watkins speed 360 would be marked H. & D. 500, whereas according to M. Clerc's table it should be about 245, and his H. & D. figures are somewhat higher than Eder's.

These higher figures are of little importance, however, so long as we are accustomed to them and we can obtain a proper equivalent as an actinometer number, but when it comes to an attempt to synchronise the Watkins and the Wynne numbers we get on to much more difficult ground.

The comparisons given by M. Clerc are the usual ones which appear to be accepted by most authorities, and are based upon mathematical formulæ, which, I believe, are agreed to by the respective meter makers. I submit, however, that they are incorrect, and also that a proper comparison is a practical impossibility for reasons that I shall endeavour to explain.

In comparing the exposure scales of the two meters it will be found that the equivalent speed numbers assume that the time required to obtain a tint match is 50 per cent. greater with the Watkins than with the Wynne meter, i.e., a ratio of 1½:1, and this is correct, when the tests are made direct to very bright sunlight, but, with the same strength of light, if the tests are taken in the shadow of the body and facing the sky, the ratio changes to 2:1. If a number of tests are made under a variety of lighting conditions—both indoor and out—it will be found that the ratio increases to as much as 8:1.

Which meter will indicate correct exposure is another question, but I submit that to attempt to make a true comparison is bound to end in failure.

E. A. BIERMAN, F.R.P.S.

SYSTEM IN HALF-TONE OPERATING.

To the Editors.

Gentlemen,—We cannot but demur to Mr. Bierman's description on p. 190, "B.J.," March 31, of the system of half-tone operating used by us at the L.C.C. School of Photography and Lithography. In that system the aperture ratio and the screen ratio are kept constant, but he makes us change the stop with different screen rulings, which is contrary to our practice. It is not to be assumed that we regard this system with any degree of finality, but we consider it the most complete and simple with which we are at present acquainted, and it has stood the test of commercial practice. We are by no means clear as to what is comprised in the "pinhole theory," but we have used as a working hypothesis the idea that the varying exposure in the penumbral shadow of the screen is the controlling factor in the formation of the different-sized dots. Whether it is really the effect of this, or of the plate characteristic, or of the scatter in the film, or of

diffraction, has yet to be demonstrated. Mr. Bierman's statement regarding diffraction is interesting, and we await with interest the publication of his experiments.—Yours faithfully,

W. J. Smith, F.R.P.S.
E. L. Turner, F.R.P.S.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

E. K.—The Tudor cameras are, or were, made by Houghtons, Ltd., 88-89, High Holborn, London, W.C.1, from whom perhaps you may be able to obtain plate-holders

E. F.—We cannot identify the camera from the description in your letter, but cameras of this kind of all makes are supplied by Messrs. Jonathan Fallowfield, Ltd., 146, Charing Cross Road, London, W.C.2. Your best plan would be to apply to them for particulars.

S. Boyle.—A lens bearing the mark of 1748 cannot be what is now called a "rapid rectilinear." So far as photographic lenses are concerned we do not think your instrument has any historical value, and probably it has no such value as a specimen of pre-photographic lenses.

H. E. H.—In many places the police authorities require a hawker's licence to be taken out by people carrying on the class of business you describe, while in other places the police do not place any such restriction. We should think you would not run any risk in starting without a licence. If you were pulled up you would then have to obtain a hawker's licence.

G. G.—So far as we know there is no particular reason why the chrome alum should be used in any definite proportion to the metabisulphite. The metabisulphite is the anti-stain constituent, and requires to be present to the extent of, say, one-twelfth to one-twentieth of the hypo. The chrome alum determines the degree of hardening, and an average strength for this purpose is from 3 to 5 per cent.

E. F.—A power of 400-c.p. is not nearly enough. We should say 1,000 is the minimum, used either as one lamp or two, but 2,000, that is two 1,000-c.p. lamps, would be better. A good deal depends on the size of the room and the colour of the walls. In a comparatively small room, with light walls, you could do with somewhat lower power, but in any case we do not think you can very well go below the powers we have mentioned.

M. F.—We can quite imagine that the metal surface repels mountants such as starch and dextrine. We think you could mount the prints with a solution of shellac in spirit, which is a bit tricky to use but quite practicable, at any rate if the prints are not of very great size. Another mountant, which perhaps would be satisfactory, is gelatine used hot, that is to say, the mountant liquefied by heat and the latter quickly put on the mount. Again, if prints are of large size this is not an easy process, but is facilitated by working in a well-warmed room.

G. W. N.—You can procure the tracing cloth from any firm selling engineer's draughtsman's materials, such as J. Halden & Co., 15, Broadway, Westminster, London, S.W.1, or Winsor & Newton, 37-40, Rathbone Place, Oxford Street, London, W.1. If your lamp cabinet is to be a fixture it will be advisable to have an extra lamp as a high front light, or you will be able to get very little variety in your lighting. If your half-watts are on the opposite side of the sitter from the window, we should advise blocking out the daylight, as it would be very difficult to balance the two sources of light of different colours and values.

J. U.—(1) The folding focal plane camera of the Goerz Anschutz type, it is used by the majority of Press photographers. (2) In proportion as you increase aperture (for a given focal length) you decrease depth. There is no way out of this difficulty. The reason why you observe such great depth in cinema pictures is that these are taken with a very small lens of about 3 in. focal length, and, say, *f*/4.5 aperture. The depth in the small pictures is, therefore, very great, and when they are enlarged on the screen the want of sharpness is not observable at the average distance of the spectators. For high-speed Press work with a 5 x 4 camera *f*/4.5 is about as large an aperture as can be usefully employed. If of half-plate size, we think *f*/6 or *f*/5.6 is as fast as it is well to have.

J. B. A.—Hydroquinone stain, if heavy as that on your negatives appears to be, is difficult to get rid of. About the best means is a process worked out some year or two ago by the Ilford Co. and consisting in using a solution which, at one and the same time, bleaches the negative and acts upon the stain. This solution is :—

Potassium permanganate	50 grs.	5.7 gms.
Common salt	¼ oz.	12.5 gms.
Acetic acid (glacial)	1 oz.	50 gms.
Water	20 ozs.	1,000 c.c.s.

If the negative is one freshly made, it is as well to pass it through a weak bath of chrome alum (about 50 grains in 10 ounces of water—i.e., 10 gms. per litre) before applying the bleacher. The latter is allowed to act for ten minutes, rocking all the time. It cannot harm the gradations of the negative, and this full time makes sure of the removal of the stain, and avoids a repetition of the process. After a brief rinse, the negative is left in a solution of potass metabisulphite (1 ounce in 20 ounces of water) until white everywhere to the back of the film, and is then re-developed in any non-staining developer.

G. Y.—It would take too long to give detailed instructions by letter for fitting studio blinds. You will find them with diagrams in "The Portrait Studio," which our publishers will forward for 1s. 3d. post free. Dark casement cloth, blue, green or brown, will do for the dark blinds, but be careful that the colours will not fade. White nainsook or madapolam, which you can get from any draper, is best for the white ones. Backgrounds are usually 8 x 8 ft., but smaller ones, about 7 x 5, will be sufficient for heads or half-lengths. It is better to have them fixed upon frames as you can then place them where you please. It is a good plan to finish one end of the studio with a dado and frieze like an ordinary room to serve as a group background. Ordinary light brown linoleum is best for the floor, with a small carpet or rug to lay down for indoor full lengths. Messrs. Marion, Kodak and Griffin all specialise in backgrounds. We cannot say whether your customers would appreciate P.O.P. portraits. It would be wise to give them the choice of these and bromides. We do not think it matters to the public whether you use the initials M.P.P.A. or not.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3233. Vol. LXIX. FRIDAY, APRIL 21, 1922. Price Fourpence.

Contents.

SUMMARY.

Next week's issue of the "B. J.," that of April 28, will contain a full advance notice of the "Photographic Fair, drawing special attention to the many new goods which are to be shown there for the first time by exhibitors. (P. 225.)

Good use of that portion of the overhead charges of a studio represented by the window display is the theme of an article by Mr. Mervyn Thompson, whose advice is prompted by the different kinds of display employed by two adjacent studios. (P. 227.)

We publish an interesting photograph of three veterans of professional portrait photography—Messrs. E. Ireland, Lafosse and Warwick Brookes, all of Manchester. (P. 228.)

Some of the means which may be taken during a season of flatness towards the reconstruction and improvement of a photographic business are the subject of an article on page 226.

At a recent meeting of the Lancashire Society of Master Photographers Mr. Percy Guttenberg had many valuable hints to give on the business management of a photographic studio, and afterwards gave a demonstration in his own studio of posing and lighting by artificial light. (P. 236.)

The condemnations by Dr. Henry B. Goodwin of theatricality in photographic portraiture, delivered at an R.P.S. lecture, will be found reported on page 235.

In the concluding part of their paper on the gloss of photographic papers Messrs. Loyd A. Jones and Milton F. Fillius, of the Eastman Research Laboratory, bring together a number of the results of their measurements. (P. 229.)

Convenient practical forms of background reflectors are described in a paragraph on page 226.

A fitment for the making of lantern slides by the use of an enlarging installation is described by Mr. D. Charles in "Assistants' Notes." (P. 232.)

The service which careful choice of a border tint may render in improving the appearance of a faulty print or enhancing that of a good one is referred to on page 226.

A very simple formula may be used for ascertaining the best point on which to focus for the purpose of avoiding unnecessary stopping down of the lens when making large scale photographs of small objects. (P. 226.)

The making an application for a provisional patent specification is an inexpensive means of obtaining protection for an invention for a limited period, with option to abandon the publication of details which the completion of a patent involves. (P. 225.)

A specification dealing with the design and construction of the Eastman vertical self-focussing enlarger will be found under "Patent News." (P. 233.)

EX CATHEDRA.

The Fair. Further information which has reached us of the exhibits to be shown at the Photographic Fair, opening at the Horticultural Hall, Vincent Square, Westminster, on Monday week, May 1, shows us that the visitor, whether professional, amateur, or dealer, will have so much to see that no one wishing to know of the many new goods coming on to the market for the coming season can consider for a moment the possibility of absence from this gathering of the manufacturers. Among makers of cameras and other equipment for amateur photography reduced prices claim as great a share of firms' propaganda as the many new models and kinds of apparatus, a two-fold description of progress which must inevitably draw within the ranks of active photographers those who have perhaps held aloof during the past two years. The caterers for the professional photographer are equally active in these respects, and in the display of portraits on the latest grades and varieties of printing media offer for the professional's inspection collections of work which in the aggregate are comparable with the exhibition of portraiture by leading professional photographers in the United States which forms one of the special features of the Fair. The particular kind of result which a printing paper yields is one of the most difficult things to describe or to show by one or two specimens, and probably portrait photographers have no better opportunity in the course of the year of fully informing themselves of what manufacturers are doing for them than at the Fair. As already announced, bona fide professional photographers may obtain a pass for the whole period of the Fair for the sum of one shilling on application to the Organising Secretary, Sicilian House, Sicilian Avenue, Southampton Row, London, W.C.1.

* * *

Protecting Inventions. From time to time we are the recipient of often confidential enquiries from readers who have perfected some new photographic requisite—such as a piece of apparatus, material used in the making of negatives or prints, or some chemical preparation. The enquirer naturally has the wish to profit by his originality, and usually is in doubt of the best course to take for that purpose. While the advisable course differs according to the invention, there is one thing which applies to any novelty, and that is, protection of the invention, at any rate, until some arrangement has been come to with a manufacturing or other firm. Many of the leading firms, in fact, make it a condition that an invention shall be protected before they will receive particulars of it, for the obvious reason that they do not wish an inventor to be able to charge them with having taken any unfair advantage of him. Although the full protection of inventions by letters patent is a complicated and costly business, it is fairly

simple and inexpensive at this initial stage, for provisional protection, lasting for a period of about nine months, is obtainable at the cost of £1, if the inventor draws up his provisional specification himself, or for a pound or two more if he employs an agent. During this time he is protected from the date of his application, and if on negotiation it is thought undesirable to allow the details of the invention to be published, as they would be in a complete specification, the application may be dropped at the provisional stage, so that even such particulars as have been given in the provisional specification are not published, since the Patent Office issues copies only of such specifications as are completed, accepted and sealed.

* * *

Background Reflectors. The orthodox studio reflector is rather an expensive item nowadays, and many photographers now prefer a home-made article. A frame covered with white calico with a hinged strut answers the purpose perfectly, but for fancy lighting, in which more than one reflector is needed, it will be found advantageous to construct the second one so that it will serve on occasion as a white background for heads and sitting figures. Six feet by four is a convenient size, and the frame should be fitted upon feet or brackets so that it will stand vertically. One side should be distempered white and the other a rather light grey. This latter colour is useful, not only as a background, but as a reflector when white would be too glaring. As an alternative, one side may be painted a dead black, forming a useful background for some classes of portraits or commercial work. Care must be taken in mixing black distemper to avoid an excess of size, which gives a slight gloss. The colour is improved for photographic purposes by mixing in a little Venetian red, which gives a warmer tone to the eye and a more non-actinic colour in working.

* * *

Border Tints. There is a great temptation in dry-mounting photographs to introduce a border tint, whether it be necessary or not. Although many portraits show to the best advantage upon a perfectly plain mount, there are others whose shortcomings can be minimised by using a suitable border. Thus, a hard black and white print is rendered more harmonious by mounting upon a pure white board with a black tint. Conversely, a flat greyish print is better upon a mount and tint, neither of which is lighter or darker than the highest light or deepest shadow in the subject. Prints which are unsatisfactory in colour can be improved by choosing a suitable tint. Thus, a print which is brownish, or perhaps, more correctly, rusty looking, should be mounted on a warm toned border, which by contrast makes the image appear blacker. A cold grey would have the effect of making such a print look still more rusty. As a general rule, warm French greys, buffs and browns will be found most generally useful, with black and white for special effects.

* * *

The Point to Focus On. Among the many formulæ relating to depth of focus there is one which has a greater practical usefulness than many others, since it does not involve the much-discussed standard which may or should be taken for the diameter of the disc of confusion. This formula is that which gives the distance from the camera on which one should focus if the best available definition is to be obtained also on a nearer and a more distant object. In the case of subjects, all the parts of which are at a relatively great distance from the camera, the formula is not of much importance, since any required definition is readily obtained by stopping down the lens, depth being great in those regions of the object space which are at considerable distances from the lens. On the other hand, if a quite near object, *e.g.*, a mineral specimen, is being photographed on a large scale, such as same size, and therefore is necessarily close to the lens, depth is very small, and it is worth while to ascertain by simple calculation what is the best point on which to focus. On then stopping down the lens the minimum waste of definition will be secured with any given stop. The formula is as follows:—Multiply the distance of the further point from the diaphragm by the distance of the nearer point and then by 2, and divide the product by the two distances added together. Thus, if the furthest point is 5 ft. and the nearest 3 ft., the distance on which to focus is $5\times3\times2\div(5+3)$, that is to say, $3\frac{3}{4}$ inches. In other words, we should focus on the part of the object which is 9 inches behind that portion of the object nearest to the camera.

SLACKNESS AND PROGRESS.

THERE are one or two months, sometimes more, in every year in which orders for portrait work become few and far between, and during such periods the photographer usually becomes despondent and wonders why he did not choose some occupation less seasonal in its character. When trade revives this melancholy vanishes, not to return till the next dull period. A very useful tonic in such cases is to adopt the plan of making a chart on which the rise and fall of the business barometer can be recorded week by week, which will show that in a properly-conducted business such fluctuations are normal, and, provided that the year's takings are well maintained, need cause no anxiety.

In a progressive art like photography these periods of leisure may be utilised to the profit of the artist, if he is sufficiently in love with his work and wishes to raise its standard year by year. It is a mistake for the humblest photographer to think that his work is good enough for his customers, and not to trouble to do better. Customers may accept their portraits and consider them as good value, but in these days of cinemas, illustrated magazines and picture shops, there are few who are so uneducated as not to appreciate good work when they see it. Now, it is a remarkable fact, which few seem to appreciate, that it is no more trouble or expense to make good photographs than to make bad ones, once the way of making good ones has been mastered, and the slack season gives the opportunity for this to be done.

A photographer, whose name is well known in the profession, says that when a young beginner, being discouraged by the difference between his work and that of the best portraitists of the day, he reasoned thus: "My lens will give as good definition as is shown in these pictures, I can buy the same plates and papers, I use the same daylight. Why, therefore, is my work inferior"? It was obvious that the fault was with the producer and not the materials, so securing a few really good specimens he set to work in dead earnest to make something like them, taking negative after negative, until a near approach to the desired standard was attained. The printing problem was next attacked, with the result that a soft warm-toned picture superseded the hard purple-black results of his early efforts.

Not everyone is in need of such drastic reformation as this, but there are few experienced workers who would not be the better for taking stock of their methods and endeavouring to bring them up to date. Unfortunately,

there is some little difficulty in obtaining specimens of the best work for comparison, and the exhibitions are little helpful in this direction. In the old days, when the Exhibition in Pall Mall was devoted to the technical rather than the artistic side of photography, the humble professional had the opportunity of seeing what was then considered the highest class of work; now small every-day work is never seen. If the P.P.A. could include a section of such work in their exhibition it would be of the greatest educational value.

Apart from improving the general style of work there are many matters of detail to which attention may be turned in times of leisure. There is such a multiplicity of plates and papers now on offer that it is impossible to tell, without actual experiment, whether a more suitable grade might be selected in place of that already in use, and this cannot be done in a perfunctory way. It is quite a common practice to test a fresh brand of paper with the developers already in use, irrespective of the fact that a special formula is necessary, with the consequence that the paper is condemned as inferior to that which is being used with its appropriate solutions. The same thing occurs with plates; a new brand of high speed requiring long development is treated in the same way as a slower, quick-developing plate, and is found to give flat thin images. If the maker's word is to be relied upon—as practically it always can—it is up to the photographer to follow the instructions given until success is attained.

As it is with materials, so it is with apparatus. Many photographers have at one time or other bought lenses with which they have been disappointed, this being specially so with those of the soft-focus variety. These require a special study to be made of focussing, and this cannot be done while a sitter is waiting. Once mastered by a few experimental exposures on the same model, these lenses are as easy to use as any others, softness in the place of fuzziness being afterwards readily attainable.

Another direction in which spare time may be employed with profit, not only to the individual but to the whole profession, is in the instruction of assistants. We have letters from time to time on the ignorance and incompetence of those who apply for work. Who is to teach them but their employers. It may seem altruistic to recommend teaching a youth to do good work when he may at any time leave "to better himself," but a moment's reflection should show that if he is worth more money to another photographer it is time the original employer raised his wages.

The necessity for making structural alterations in the premises, repairing and remodelling apparatus, renewing blinds and all work of this class during the slack season should be so apparent that it hardly needs pointing out, yet it is often neglected because there is little or no money coming in. It should be remembered that facilities for working mean increased profits, and that such work can usually be obtained more cheaply before the spring rush of decorating and building begins.

A QUESTION OF OVERHEAD CHARGES.

Passing down one of the principal streets in the West End, I stopped to examine carefully the window display of a particular photographer. The portraits were displayed in close formation upon a panelling of dark oak, and must have numbered nearly a hundred. The quality of the work was excellent. The combined cost of the fittings and specimens must have represented something very considerable in cash outlay, both in the initial stage and to maintain. In spite of the expensive "get-up" I was not particularly impressed. I did realise that here was a photographer's shop where work of reasonable quality was produced, but that was all.

Strolling along I presently came across another photographer's. Accepting a certain standard of technique to be common to both, it would have been extremely difficult to find two businesses, that upon a first acquaintance, appeared to be administered in a manner so completely different. In this second case a few simple hangings and less than half a dozen specimens represented the photographer's "appeal" to the public. The cost, compared with the other man's oak and brass plates, was surely infinitesimal! Here, I felt, was not only the photographer but the artist—and yet I was conscious of something more.

During the next two months business took me into the neighbourhood, and I set myself to spend a few minutes each day in careful observation. I found the shop with the panelled oak did attract, but in a very superficial manner, whereas the other window seemed to draw the public in a much greater degree. Passers by not only stopped to look into this window but, having looked at the photographs, looked up again at the shop. The shop attracting in the first place drew recognition to the work; the specimens and the method of arrangement seemed to convey not only a photographer's work exhibited in a shop, but this photographer's and this shop. Here I thought was that something more—but not quite all.

Fifteen times was this window changed—seeming carelessly. A specimen added, a specimen taken away, a bowl of fruit in tumbling disarray pushed into the centre space, an alteration to the drapery, in any case a comparative triviality, but creating a distinct and definite change. Here, then, was that something—here was not only the artist photographer but the keen, alert, business man, who, realising the permanent liability upon his business by the very fact of his shop rent, saw that he got value for money. He gave the shop window his constant personal attention, and expended just as much of his care and skill upon getting people into his studio as he did when he had them there. I was not surprised when, at the end of five weeks, the window with the oak panelling was taken out, remained out two days, and was then replaced in precisely the same manner with exactly the same conflicting and monotonous effect.

Photographers, as business men, should realise to the full the meaning of establishment charges. The man with the oak panelled display laid out his money both in capital expenditure and recurring charges presumably of a very substantial nature. His shop rent, with rates, etc., added, probably represented his largest individual liability, which he apparently was content to leave to the care of a junior assistant.

Establishment and overhead charges are the big bug-bear of business. When things are slack less material is used, less labour employed, but rents and so forth remain substantially the same. It is one thing to reduce establishment charges to the minimum which is that all business men seek to do, but it is not enough. Such heavy expenses should be kept continually in mind, be continually reviewed, and be administered or applied with the utmost skill. It is only fair to your business.

I do not quarrel with the gentleman of the oak furnishings because of his oak or because of his hundred specimens; his

show probably served his purpose as well as the other man's. I do question his policy of leaving the matter in the entire hands of an assistant.

Photography as an art is appealing more and more to the artistic sense of the public. The days of the crude "likeness" are past. A photograph now is expected to render not only outline of form and feature, but something of character as well. By applying skill and technique to the careful consideration of the characteristics of the sitter and production of the finished portrait, the photographer hopes to give satisfaction and build up or increase his business. It is not too much to say that that same skill and consideration should be continually used for the administration of all your assets, in order to apply them to the greatest advantage, for the benefit of the business as a whole.

MERVYN THOMPSON.

A TRIO OF PHOTOGRAPHIC VETERANS.

IT IS not often that the opportunity occurs of making a photograph of three veterans of photography such as that which we reproduce on this page by the courtesy of Mr. C. Ireland, of Manchester, son of one of the sitters. The photograph represents Mr. Lafosse who is now 85, Mr. Warwick Brookes who is 76, and Mr. Ireland who is 79. They may justly be called the three veteran photographers of Manchester, and are all fortunately still hale and hearty and happy in their well-earned leisure. All three were enthusiastic in their art in the early sixties, and made their mark in one branch or another of photography at that time. Mr. Lafosse, perhaps, is notable chiefly for the share which he took in raising the photographic portraiture of his time to a higher artistic level. Those of us whose memory goes back a number of years readily bring to mind the characteristic beauty of not only his portraiture but his outdoor figure studies and landscape. Mr. Lafosse still retains his artistic talents, and employs himself almost every day in making studies in black and white after the style of George Shelfield, whose pupil he was. He is seen in the centre of the group.

Mr. E. Ireland, a most assiduous worker, may perhaps be described as the man of many studios, the arrangement and supervision of which absorbed his energies. He did much to popularise portrait photography not only in Manchester but in many of the adjacent towns. In his day the whole plate portraits, particularly by their artistic mounting, struck a high and meritorious note in studio portraiture.

For Mr. Warwick Brookes may be claimed the introduction of the present practice of negative retouching if not into Europe, at any rate into England. Both he and Mr. Lafosse brought retouching to a high state of technical perfection. For some time the method was a secret which puzzled competitors, and brought its possessors greatly into favour among fashionable customers. Mr. Brookes was the inventor of a small magazine hand camera, on which principle many cameras of this type were made, and obtained widespread popularity until the introduction of roll film rendered easier the design of much more portable instruments.

THREE VETERANS OF PHOTOGRAPHY. *Photograph by C. Ireland, Manchester.*
From left to right, Mr. E. Ireland, Mr. Lafosse, Mr. Warwick Brookes.

It is, of course, hardly necessary to mention that all three of these pioneers made their reputation, artistic, technical or commercial, in the days of the wet-plate process. At such gatherings as that shown in the group photograph they can be imagined as exchanging notes on the stages through which photography has progressed since their early days, and on the disappearance of the vagaries which attended the making of wet-plate negatives. It may perhaps be questioned whether they are of the view that the technical quality of modern studio work has advanced in correspondence with the facilities with which modern manufacture has endowed those of the present day.

THE GLOSS CHARACTERISTICS OF PHOTOGRAPHIC PAPERS.

(A Communication from the Research Laboratory of the Eastman Kodak Company.)

(*Concluded from page* 218.)

Results.

Effect upon Gloss of Variations in Illumination.—In order to determine the influence of the type of illumination used in illuminating the sample upon the resulting gloss values, the following series of measurements were made. Eleven samples of paper varying widely in glossiness were chosen. The gloss values for each of these were then measured, using a collimated beam incident at 45 deg. in illuminating the sample. The results of these measurements are given in Table 1 in the column marked "parallel." By removing the lens, D (see fig. 1), and replacing it with a disc of opal glass of proper dimensions, the sample was illuminated by a source subtending .01 of the steradian at the sample. A second series of gloss measurements were made and the results are given in Table 1 in the column marked "semi-diffuse." It will be noted that in all cases the values obtained with parallel illumination are higher. For instance, for the most glossy surface, the reading of the semi-diffuse illumination is 12.4, while with a collimating illumination a value of 24.0 was obtained. It is evident in both cases that for a glossless surface the reading must be zero. The use of

TABLE 1

Sample.	Parallel.	Semi-diffuse.
1	0.43	0.36
2	0.43	0.39
3	0.78	0.78
4	1.20	1.03
5	1.89	1.65
6	2.28	1.91
7	3.96	3.12
8	13.6	9.0
9	21.2	10.9
10	22.9	12.6
11	24.0	12.4

collimated illumination, therefore, gives a more extended scale and increases the ability to detect differences between samples varying but slightly in gloss value. For this reason, therefore, and also because a satisfactory brightness can be obtained more readily for this type of illumination, it was decided to adopt the parallel illumination as a standard condition for the measurement of gloss values.

Effect upon Gloss of Various Surface Treatments.—In order to determine the effect of certain surface treatments upon the gloss characteristics of various stocks, eleven samples of raw stock used in the manufacture of photographic papers were chosen as representing the entire range of gloss variations which occur with these materials as they come from the mill. The values of gloss will be found in Table 2, column 1. It will be noted that there is a relatively small variation in the gloss of these samples. Other samples from the same stocks were examined after having been coated with baryta. The gloss values obtained are shown in the second column of the table. A typical photographic emulsion was chosen, and by coating this on each of the eleven stocks selected a finished developing-out paper was obtained. Samples of each were fixed out, washed and dried in the usual way, and the gloss values determined. These values will be found in column 3. A second lot of emulsion containing a suitable material for the production of a more matt surface in a photographic paper was used in making up an additional set of samples from the same paper stocks. Samples from these were treated as previously, that is, fixed out without exposure, washed, dried and the gloss values obtained. The values determined are shown in column 4.

It is impossible to analyse completely the results shown in Table 2. The effect of the baryta coating is not the same in all cases, and this undoubtedly is due to peculiarities of treatment that occur in the process. However, it will be noted that in all cases the gloss values are increased appreciably by coating the various samples with plain emulsion, while the use of the matt emulsion reduces the gloss value in all cases. In fact, the gloss values given in column 4 are so nearly equal that but little variation in gloss is apparent in this group of samples.

TABLE 2.

Sample No.	1. Raw Stock.	2. Baryta Coated.	3. Plain Emulsion.	4. Matt Emulsion.
1	0.33	0.10	0.43	0.24
2	0.36	0.14	0.43	0.19
3	0.62	0.06	1.89	0.18
4	0.45	0.05	0.78	0.29
5	0.69	4.21	24.0	0.44
6	0.40	0.31	3.96	0.29
7	0.70	4.94	21.2	0.29
8	0.50	5.08	13.6	0.35
9	0.49	0.55	1.20	0.34
10	0.83	8.45	22.9	0.35
11	0.51	1.65	2.28	0.55

Variation of Gloss with Diffuse Reflecting Power.—When a photographic paper is exposed and developed, small particles of metallic silver are produced which, since they have a very low reflecting power, reduce the reflecting power of the surface. This blackening of the surface reduces the amount of light diffusely reflected without appreciably changing the amount of light which is reflected specularly. This follows from the fact that practically all of the specularly reflected light is that which is reflected from the surface layer of the material that is at the boundary of the air-gelatine surfaces. It will be seen, therefore, that when gloss measurements are made on photographic papers that have been subjected to varying degrees of exposure, a rapid increase in the gloss value must occur, since R_s remains practically unaltered, while R_d decreases to a very marked extent.

In order experimentally to determine the relation between photographic density and gloss, a series of measurements were made on the samples that had been subjected to various degrees of exposure, developed, washed, and dried in the usual manner. It might be well to point out at this place that the word "density" as used in this connection is defined by the equation D (density) = the logarithm of $\frac{1}{R}$ (reflecting power), where R is the value of diffuse reflecting power as measured under certain definitely specified conditions of illumination and observation.

Three standard photographic papers representing a low, medium, and high gloss were used for the determination of the relation existing between density and gloss. Numerical results are given in Table 3, and these are plotted in graphic form in fig. 5, curve A representing the variation in gloss value with

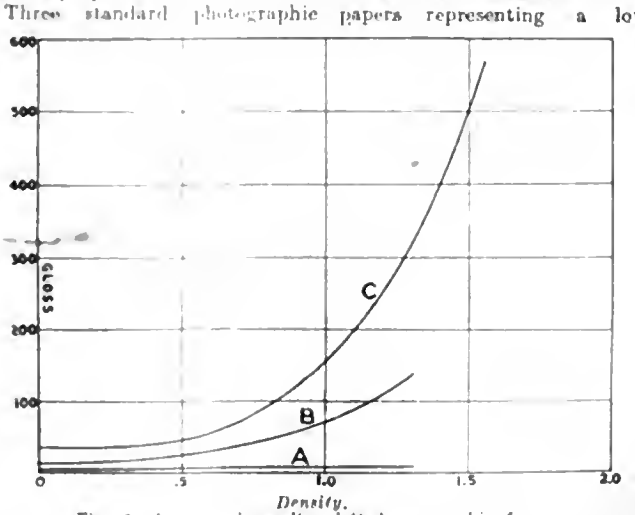


Fig. 5. Numerical results plotted in graphic form.

density for *Iris D*, curve *B* for *Azo K*, and curve *C* for carbon black glossy.

TABLE 3.

Sample.	Density.	Gloss.
Iris D	0.00	0.22
	0.36	0.39
	0.70	0.85
	1.02	2.00
	1.30	3.25
Azo K	0.00	4.30
	0.59	22.8
	0.92	51.0
	1.30	135.0
	1.70	307.0
Carbon Black Glossy	0.00	31.2
	0.40	29.5
	0.70	72.3
	1.07	157.7
	1.55	569.0

These results make it very evident in the case of photographic papers at least that some specification of the condition of the material under which the gloss measurement is made must be given. For photographic papers, it seems most logical to specify that gloss measurements be made on a sample which has been fixed out without exposure, washed, and dried in the usual manner. In the case of a photographic print which is made up of areas differing widely in density, usually from the minimum to a maximum density obtainable with the material, it is evident that no single gloss value applies to the entire surface—that is, gloss varies from point to point depending upon the density. While this makes it impossible to establish a fixed value of gloss to a photographic paper without specifying the value of its diffuse reflecting power, such a procedure seems to be in harmony with our fundamental concept of the term glossiness.

At first thought it may seem more logical to assume that a given surface should have a specific value in gloss regardless of other factors such as density, but a careful consideration of the problem leads us to the conclusion that our judgment of glossiness is very vitally dependent upon the diffuse reflecting power of the surface. Of, two surfaces having equal values of specular reflecting power, the one having the lower value of diffuse reflecting power will undoubtedly appear the more glossy. It has been suggested that in order to avoid the dependence of gloss upon the density, an absolute value of specular reflecting power be taken as a measurement of gloss. Such a procedure would seem to be in direct opposition to the fundamental concept of the word glossiness. As an illustration of this, let us consider the case of two equally well-groomed horses, one black and the other white, seen under a brilliant illumination such as a clear, sunny day. It is probable that the value of specular reflection in the two cases is approximately equal; and the high-lights produced by the specular reflection of the sun would be of about the same brightness, while it is undoubtedly true that a great majority of judges would say that of the two the black horse had the more glossy coat. Careful examination of samples prepared by exposing pieces of the same photographic paper to various extents and developing so that a series varying in reflecting power was obtained, indicates that glossiness increases as reflecting power decreases. The magnitude of the increase in glossiness, however, is not proportional to the increase in the value of gloss as previously specified. The correlation of the subjective sensation with the stimulus remains to be accomplished. It is probable that a method similar to that used in other fields of visual sensitometry involving the determination of the magnitude of change in the stimulus required to produce a just noticeable difference in the sensation will yield the desired results. The conclusion that our judgment of glossiness is a function of contrast seems inescapable, and, therefore, in the case of photographic papers gloss must undoubtedly be dependent upon density.

Gloss Measurements on Developing-Out Papers.—A satisfactory method for measuring and specifying gloss having been developed, and the effect of various factors upon gloss having been determined, a large number of samples of commercial developing-out papers were measured. As stated previously, certain words and phrases are at the present time used to designate in a qualitative way the gloss of such materials. There are a large number of such terms in use, but the four most commonly used are "matt," "semi-matt," 'semi-gloss," and "glossy." In Table 4 are given the results of the measurements. In column 1 is given the trade name of the material, and in column 2 is the term used by the manufacturer in designating the gloss characteristic of the surface, while in column 3 are the gloss values obtained by measuring under the standard conditions previously outlined.

The samples were prepared by taking an unexposed sheet of the material, fixing it out in a clean, fresh, acid-fixing bath, washing, and drying in the usual way. These samples were then mounted by the dry mounting process on sheets of aluminium about 1-16 of an inch thick. This method of mounting was found to be necessary in order to obtain precisely repeatable results. It is absolutely essential in doing precise work of this kind that the sample be mounted in such a way that it is held perfectly flat and smooth. If precautions are not taken to obtain perfect flatness very slight variations in the planeness of the sample introduces variations in the readings which are serious, especially in the samples having relatively high gloss. By using care in pre-

TABLE 4.

No.	1. Name.	2. Surface.	3. Gloss.
1	Magnesium Carbonate	Matt	0.10
2	Azo A	Carbon	0.20
3	Artura Iris D	Matt	0.22
4	Bromide Matt Enamel	Smooth Matt	0.23
5	Artura Iris C	Smooth Matt	0.30
6	Artura Aegis, No. 2	Smooth Matt	0.30
7	Velox Carbon	Matt	0.32
8	Azo B	Rough	0.38
9	Azo AA	Carbon	0.40
10	Velox Portrait	Smooth Matt	0.43
11	Carbon Black	Rough Matt	0.44
12	Carbon Black	Matt	0.67
13	Artura Iris B	Semi-Matt	1.57
14	Bromide Standard B	Smooth	1.87
15	Artura Iris A	Smooth Semi-Matt	2.00
16	Velox Velvet	Semi-Matt	2.47
17	Azo E	Semi-Matt	2.78
18	Azo K	Semi-Gloss	4.30
19	Bromide Velvet	Semi-Gloss	4.34
20	Azo C	Glossy	14.5
21	Bromide PMC 1	Glossy	22.9
22	Azo F	Glossy	23.8
23	Velox Glossy	Glossy	24.8
24	Carbon Black	Glossy	31.2
25	Bromide Enamelled	Glossy	32.2
26	Solio Ferrotyped	Glossy	66.3

NOTE.—The values in this table were determined on samples taken at random from stock, and do not represent the standards for the materials indicated.

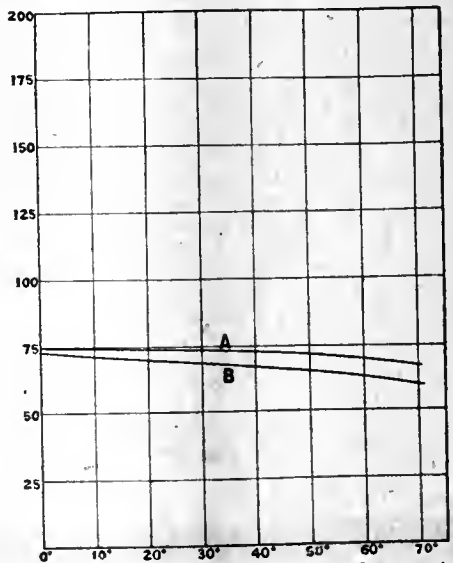


Fig. 6.—Distribution curves for samples Nos. 2 and 12.

paring the samples, it was found that values can be repeated from time to time to within approximately ± 4 per cent. The first value given in Table 4 is that for magnesium carbonate. This sample was prepared by taking a block of the material, and carefully scraping the surface with a steel straight edge. It will be noted by comparing the value of gloss with the terms used in the description of this factor that surfaces having values up to .67 are described as matt or carbon, while values ranging from 1.57 to 2.78 apply to surfaces described as "semi-matt" or "smooth." Only two surfaces designated as "semi-gloss" were measured, and for these the gloss value was 4.3. The range from 14.5 up to 66.3

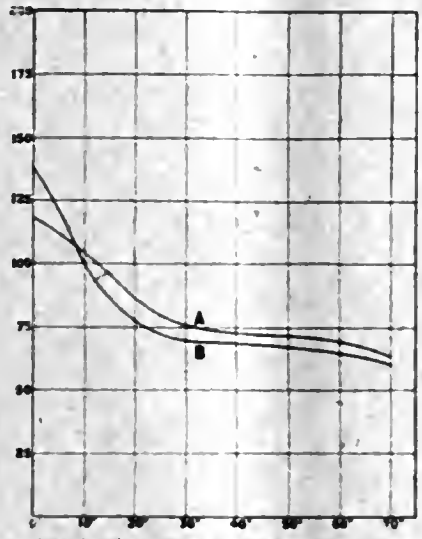


Fig. 7.—Distribution curves for samples Nos. 13 and 17.

applies to those surfaces designated as "glossy." Before reaching a final correlation between the numerical gloss values and verbal descriptions of the surface, it would be well to examine a much larger number of surfaces. However, on the basis of those already examined, the following classification is proposed.

In the following table are given the numerical ranges of gloss value which apply to the various descriptive terms. It is obvious that there is no distinct line of demarcation between the various classes, but it is convenient from the practical standpoint to make

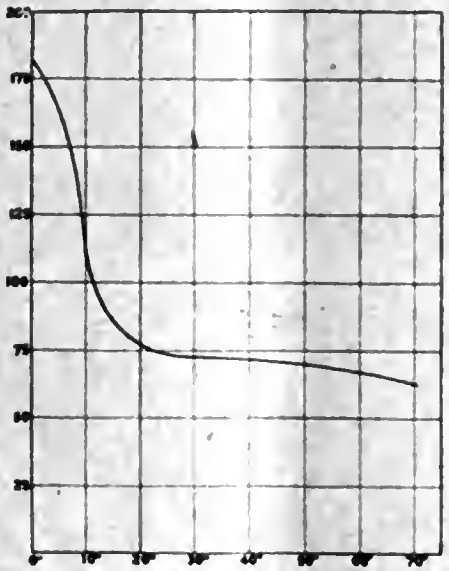


Fig 8.—Distribution curves for semi-gloss class.

a more or less definite division of the scale. The point separating the classes designated as "semi-gloss" and "gloss" is indicated as 7.0. This is a rather rough estimate since but few surfaces designated as semi-gloss have thus far been examined. It is possible that more complete data on the subject will make it necessary to alter the division point between these two classes, but at the present time it is thought that the value chosen is approximately correct.

TABLE 5.

Descriptive Term.	Range of Numerical Values.
Matt	0.0 to 1.0
Semi-Matt	1.0 „ 3.0
Semi-Gloss	3.0 „ 7.0
Glossy	10.0

In order to show the relation between gloss values and the distribution curve of the light reflected from the surface, it may be

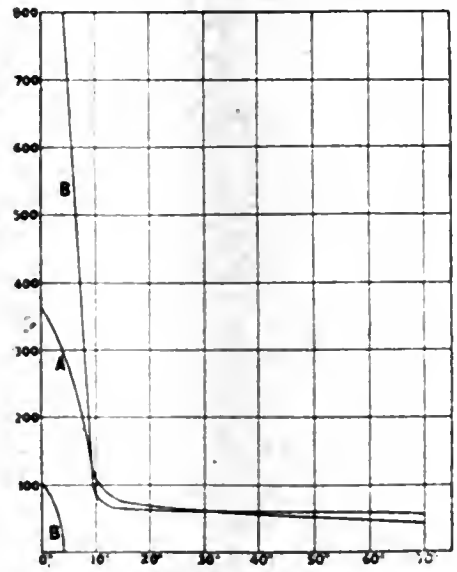


Fig 9 Curves for samples 20 and 25.

well to show graphically some of these distribution curves. In fig. 6 are shown the distribution curves for samples Nos. 2 and 12, these representing the high and low gloss values for the matt class of surfaces. These distribution curves were determined by illuminating the sample normally with parallel light and measuring brightness at various angles as indicated by the abscissæ values. The ordinate values are in terms of relative reflecting power, the reflecting power of the magnesium carbonate surface under normal illumination and observation being taken as 100 per cent. In fig. 7 are shown the distribution curves for samples

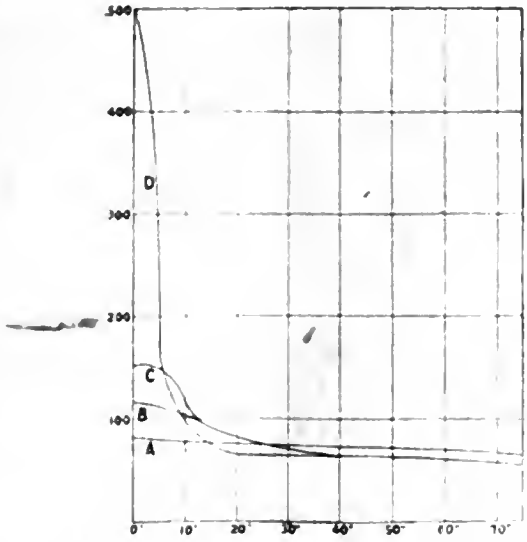


Fig. 10 Distribution curves of various classes of surface.

Nos. 13 and 17, these representing the high and low limits of gloss in the "semi-matt" class. In fig. 8 is given the distribution curve for the "semi-gloss" class. Only two examples of the classification were examined, each having a gloss value of 4.3. In fig. 9 are given curves for samples 20 and 25, these representing the limits of the "glossy" group. In order to show more clearly

the relation existing between the distribution curves of these various classes of surface, the four curves shown in fig. 10 are given. These curves represent a typical surface of each of the four groups, curve *A*, being that for sample 8, having a gloss value of .38. This value is the approximate average for the matt group. Curve *B* is that for sample No. 15, having a gloss of 2.00, this again representing the average gloss for the semi-matt group. Curve *C* is that for sample No. 19, being the semi-gloss material, while curve *D* is for sample No. 21, a typical representative of the glossy group.

LOYD A. JONES.
MILTON F. FILLIUS.

THE ACTION OF LIGHT ON A PHOTOGRAPHIC FILM.

(A Note in the Journal of the American Physical Society.)

It is a well-known fact that there is a remarkable similarity between the photoelectric and photographic properties of the silver halides. This has suggested to several writers (cf. Allen's "Photoelectricity," Chap. XIV.) the possibility of explaining the action of light on the photographic film as due to some sort of photoelectric action.

Now it has been shown that when plane-polarised light is incident upon a photoelectrically sensitive surface, more electrons are emitted when the electric vibration in the incident light is normal to the surface than when it is parallel to it. Consequently a very narrow line if photographed through a Nicol's prism should appear sharper when the direction of the electric vibration is parallel to the line than when at right angles to it. This was tried experimentally and found to be the case.

The source of light consisted of a very carefully ruled set of rectangular lines on a plane white background. Between this source and the camera lens was a high-grade Nicol's prism. The lens was a good anastigmatic lens, and fine-grained, contrast photographic plates were used.

Several photographs were taken with the Nicol so oriented as to make the electric vibration parallel to the vertical lines and several with it parallel to the horizontal lines. In every case the lines parallel to the electric vector were the sharper. The direct image on the ground-glass of the camera was also examined with a magnifying glass, but no difference could be observed between the two sets of lines.

These experiments seem to indicate the possibility of explaining the effect on the assumption of some photoelectric action. The experiments are being continued in a slightly different manner with the object of finding some more direct evidence of the effect.

JAY W. WOODROW.

Iowa State College, Ames, Iowa.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

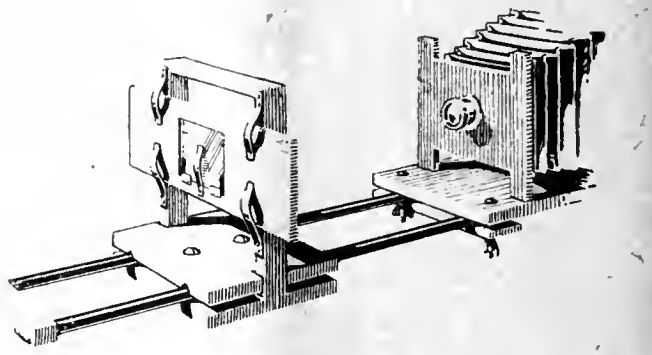
A Lantern-Slide-Making Attachment to an Enlarger.

To the half-watt enlarging installation described by me in these columns some few months ago, I have since added a detachable fitment by means of which a number of lantern-slides can be made with the greatest of ease in the minimum of time. As the construction of this arrangement is such that it can be quite well adapted to any outfit, no doubt some "B.J." readers will like to have a description of it.

It consists roughly of a pair of rails on which slides a base-board carrying an upright square frame. The latter holds, by means of flat springs, a strip of board, in the centre of which is a hole of the standard 3¼ in. by 3¼ in. The latter takes a piece of ground-glass for focussing, and when the image has been correctly focussed and centred, etc., which this apparatus renders rapid and easy, a ruby cap is put on the lens and the ground-glass replaced by a lantern-plate.

The rails are two pieces of electric-lighting conduit about 4 ft. long. At each end of these holes were drilled to allow of screwing securely to wooden cross-pieces. The base-board of the enlarger is bored with two ¼-in. holes, through which a couple of bolts are dropped. These bolts pass through similar holes in one of the cross-pieces that keep the rails together, and wing-nuts are employed for tightening up. The cross-piece at the other end is hinged to a strut of the same height as the base of the enlarger from the floor. When detached, the strut folds against the rails and the whole hangs up out of the way on a nail. The base-board and frame are built of hard wood one inch thick and about a foot in each direction. The clamping piece will be seen in the illustration and is of similar substance, and both this and the fixed base are grooved slightly to ensure alignment when sliding on the rails. A couple of bolts and nuts allow of tightening up to a nice sliding fit that will permit of easy focussing without slipping when not required to.

The plate carrier is of half-inch stuff. The hole was carefully cut just on the loose side. After one or two experiments, instead of having a rebate the aperture was cut clean through. At the lower part of each side was fixed a bit of smooth brass about an eighth of an inch thick, shown black in the sketch. These are



just over an inch long. Higher up on each side are driven in a pair of fine nails and the heads cut off. At the bottom of the hole a pair of bits of metal are screwed to prevent the slide, when placed in position, from slipping out backwards. The spring shown holding the plate is swung to one side or the other on to the wood, and then a tap on the ground-glass or the plate, as the case may be, causes the glass to lean back, but it is prevented from falling by the spring and the metal tags; at the same time the plate is easily lifted out. To insert a plate it is only necessary to push the bottom corners against the two thick brass pieces, in which operation the senses of feeling and hearing assist that of sight, and then allow the plate to drop to the bottom. A finger and thumb are sufficient both for this and for pushing the plate forward and pulling the spring over to secure it in the upright position. This procedure takes a number of words to describe, but I have done this simply to show the best way of handling the apparatus. The extension-frame of the camera projects over the rails, although this is not shown very clearly in the drawing, and I prefer to do fine-focussing by sliding the easel rather than by moving the lens.

Suitable springs can be obtained from old printing-frames, or can be purchased under the name of "drawer-springs" from the ironmonger.—D. CHARLES.

PHOTOGRAPHING MOUNT ETNA.—A curious competition in which photography is to play a part is reported from Rome. After several weeks of violent eruption the Etna volcano is very quiet, and special efforts were to be made this Easter to secure photographs of the place. Italian holiday makers were invited to spend their Easter holidays at or near Catania (Sicily), and two ships were chartered for the trip. It was proposed to make an ascent of the mountain last Sunday morning, and, according to handbills which were distributed, there was to be an opportunity for some of the tourists to be lowered into the crater of the volcano by means of a cage affair. An offer of prizes is made by the King and Queen and the Ministers for War and Instruction for those excursionists who bring back the best souvenirs, photographs and other proofs of their courage.

FORTHCOMING EXHIBITIONS.

April 21 to May 11.—Hammersmith Hampshire House Photographic Society. Particulars from the Hon. Exhibition Secretary, J. Ainger Hall, 26, Bishop's Mansions, Bishop's Park Road, London, S.W.6.

April 22 to May 27.—Royal Photographic Society. Colonial prints arranged by "The Amateur Photographer and Photography." Open daily from 11 to 5 p.m. 35, Russell Square, London, W.C.1.

May 1 to 6.—Photographic Fair. Horticultural Hall, Westminster. Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1.

June 1 to 30.—Royal Photographic Society. Prints by Pirie MacDonald, of New York.

September 9 to October 7.—London Salon of Photography. Latest date for entries, August 30. Particulars from the Hon. Secretary, London Salon of Photography, 5a, Pall Mall East, London, S.W.1.

September 11 to 15.—Professional Photographers' Association, Princes Galleries, Piccadilly, London, W. (Trade and Professional). Hon. Secretary, Richard N. Speaight, 157, New Bond Street, London, W.1. Also foreign invitation loan exhibition of professional portraiture. Hon. Secretary, Marcus Adams, 43, Dover Street, London, W.1.

September 18 to October 28.—Royal Photographic Society. Latest date for entries by carrier, August 25. Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications April 3 to 8:—

Colour Photography.—No. 9,955. Photography in two colours. O. Pfenninger.

Thermometer Stands.—No. 9,838. Stand for thermometer for recording temperature of solutions in shallow vessels. Johnson & Sons, Manufacturing Chemists, Ltd.

Apparatus.—No. 10,022. Apparatus for photographing or projecting images. H. H. and S. H. Mears.

Apparatus.—No. 10,086. Photographing apparatus. J. Pecso.

Projection Apparatus.—No. 9,870. Apparatus for direct-vision or projection of separate transparent photographic views upon films, etc. H. de Ruyter.

Reproduction Method.—No. 9,953. Mechanically reproducing portraits, models, etc., from stereoscopic photographs. E. E. Townsend.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

Vertical Self-focussing Enlargers. No. 156,515 (February 6, 1918). The invention relates to automatically-focussing projection apparatus of the kind described in Patent No. 156,224, and has for its object to provide means whereby such apparatus can be used with lenses of different focal lengths, the lens being held in optical co-relation with the object plane and the image plane of the apparatus automatically whatever the degree of enlargement. The pinion or other member by means of which the lens board is moved relatively to the negative upon the camera support has a slotted arm mounted upon it in adjustable operative relation thereto. The slot in the arm is so curved and engaged by an adjustable lever on one of the swinging links carrying the camera support that as the support is moved towards or away from the screen or image plane the correct focus of the lens is automatically secured after the slotted arm has been initially set. Thus by varying the relative position of the slotted arm upon the driving pinion and by simultaneously varying the effective length of the lever engaging the slotted arm it is possible to secure automatic focussing whatever the focal length of the lens and without having to provide an interchangeable slotted arm as hitherto.

In the drawings, the camera 1 is mounted upon arms 2

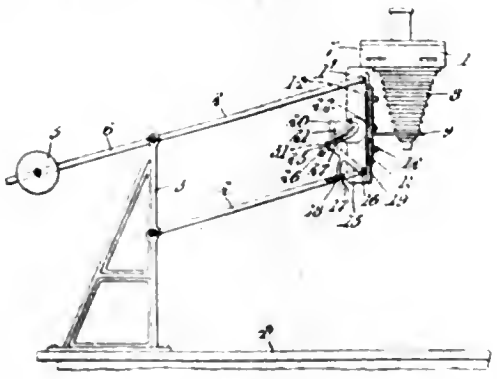


Fig. 1.

pivoted for movement in a vertical plane on to a frame or support 3 which may be attached to the wall, or, as indicated, mounted upon a table 4. One of the arms 2 may be extended as at 6, and provided with a counterweight 5 to balance the weight of the camera and other mechanism carried by the arms 2. The arms 2, together with the frame 3, and camera support 1^1, constitute a parallel link system so that the camera always moves in a plane at right angles to the projection screen or table 4.

The enlarging camera of the outfit comprises the usual box or frame 7 rigidly connected to the support 1^1, and is provided with bellows 8, terminating in a lens board 9 mounted on a carrier 11. Mounted to slide upon the support 1^1 is a bar 10, carrying a rack 14, the bar being adjustably attached to the carrier by means of set screws 12 extending through enlongated slots 13 formed in the carrier. Adjustably connected to the lower arm 2 is a lever 15 which is free to turn about its pivot 16, but is provided with a quadrantal arm 17 formed integral therewith, locked in the position of adjustment by means of a set screw 18. Thus the arm or lever 15 can be held at the required angle to the pivoted arm 2.

On the support 1^1 is mounted with a pivot 20^1 a plate 20

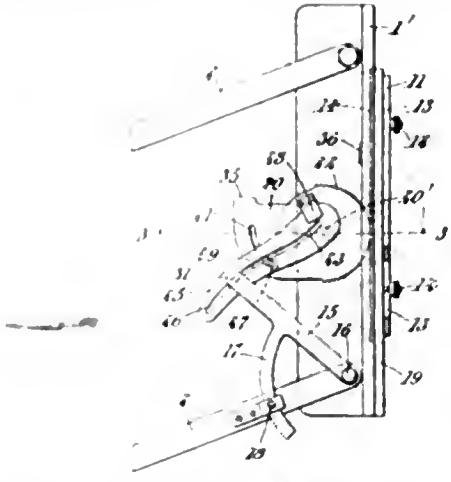


Fig. 2

having a curved slot 21 and a semi-circular portion provided with teeth 22 to engage the rack 14, the whole constituting a driving member for the rack. The plate 20 also carries a short stud 23 eccentrically mounted thereon. An arm 25 having a cam slot 26 engages the stud 23 and carries a pin 27 to engage the curved slot 21. Suitable means such as a spring plate 28 secured to the face of the plate 20 may be provided to hold the arm 25 and plate 20 against lateral separation while at the

same time admitting relative sliding movement in the plane of contact.

The pin 27 has a screw-threaded extension engaged by a nut 29 so that the arm 25 and the plate 20 can be locked together, the slotted arm then constituting a lever for turning the complete or partial pinion 22 to engage the rack. Mounted on the lever 15, near its free end, is a stud 31 adapted to engage the cam slot 26, the studs 23 and 31 and the arm 25 being so related that there is no interference between the studs during their movement in the cam slot 26. The bar 10 preferably has grooves 10^1 engaging ribs on guides 19, which may be secured to the support 1^1 in any suitable way, as, for instance, by screws 19^1.

The operation of the apparatus is as follows:—Assuming that the focal length of the lens is unknown the mechanism is set by loosening the clamping screw 18 and moving the whole apparatus into a low position. The lever 15

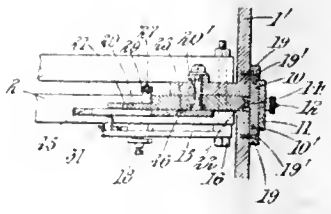


Fig. 3.

is then thrown over as far as possible to the right so that the point 35 on the plate 20 makes contact with the stop 36 on the support 1^1. With these two points in contact the projected image is focussed sharply at 1½ in. diameters magnification on to the table used as the projection screen. While the parts still occupy this position the set screws 12 and 18 are tightened whereupon the pivoted arms 2, together with the camera support, are pushed upwards a considerable distance above the screen, and the nut 29 on the stud 27 is loosened while the set screws 12 and 18 remain clamped. The sliding bar 10 is then adjusted until a sharp image is again obtained, and by so manipulating the bar the teeth on the driving member 20 by engaging the rack 14 bring about a definite angular adjustment on the driving member about its pivot. At the same time the slotted arm 25, by engagement of the stud 27 in its slot 21, is made to occupy a definite position relatively to the driving member 20.

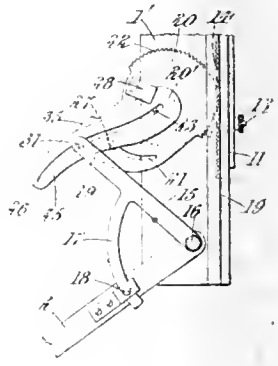


Fig. 4.

The nut 29 is then suitably tightened to lock the arm 25 and driving member 20 together, and the apparatus is then set to obtain absolutely sharp focus for any enlargement between 1½ in. to 18 in. diameter when using a lens of approximately 7½ in. focus. The form of the cam slot 26, as computed or experimentally determined for a particular lens, depends upon the length of the arms 2, the length of the lever 15 and the radius of the pinion forming part of the driving member 20.

It has been found that the cam slot designed for the longest focal length lens to be used may be used for any shorter focus lens by shifting the position of this cam slot relatively to its support and that for each lens there is one definite position in which the cam slot operates for the purpose specified. By providing means such as the curved slot 21 in the plate 20 and the stud 27 on the arm 25, the cam slot is forced to undergo such movement relatively to its supporting plate 20 that its successive positions correspond to lenses of successive varying focal lengths. The cam slot 21 is designed to cover a particular range of lens powers ordinarily met with in practice being available for use with lenses having a focal length of from 4 to 10 in. It is to be understood that there is no definite limit to the range, and the cam slot 26 illustrated is designed to admit of a magnification of 1½ in. diameters as its lower limit. Figs. 2 and 4 show, by way of comparison, the two extreme adjustments, fig. 2 illustrating the device set for a lens of approximately 5 in. focus, while fig. 4 shows the adjustment for a lens of 10 in. focus. As can be easily ascertained from the drawings, the rate of movement of the bar in the case of fig. 2 will be much less than in the case of the setting illustrated in fig. 4 for the same angular movement of the arms 2. Kodak, Ltd., Kodak House, Kingsway, London, W.C., assignees of Roy Samuel Hopkins, 1221½, Market Street, Parkersburg, W. Va., United States.

The following complete specifications are open to public inspection before acceptance:—

Films.—No. 177,805. Method of and means for securing a length or strip of photographic film in a flat coil in a condition suitable for treatment by liquid. Correxmuvek Filmipari Gepgyar C. Lazzlo.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

Apem.—No. 419,775. All goods included in class 1. Amalgamated Photographic Manufacturers, Ltd., 3, Soho Square, London, W.1, manufacturers. October 21, 1921.

Apem.—No. 419,776. All goods included in class 8. Amalgamated Photographic Manufacturers, Ltd., 3, Soho Square, London, W.1, manufacturers. October 21, 1921.

Apem.—No. 419,777. All goods included in class 13, but not including needles or fasteners for collars, and not including any goods of a like kind to any of these excluded goods. Amalgamated Photographic Manufacturers, Ltd., 3, Soho Square, London, W.1, manufacturers. October 21, 1921.

New Apparatus.

The Apem Reflex Camera. Made by Amalgamated Photographic Manufacturers, Ltd., 3, Soho Square, London, W.1.

In this camera we have the first fruits which have come under our notice of the enterprise which the Kershaw branch of the A.P.M. has undertaken, namely, the manufacture on a scale permitting of popular prices of cameras for the amateur photographer. The fact that it has been found possible to place upon the market a quarter-plate reflex camera with three single metal plate-holders and an *f*/5.9 6-inch lens at the price of £10 10s. is sufficient evidence of the success which has followed the specialised organisation of this company in camera manufacture.

As makers for many years of the Soho reflex, Messrs. Kershaw can claim perhaps a unique experience in this country in the manufacture of this particular type of camera. It is not claimed that the present model represents refinements of design and inclusion of details which have made the Soho as reliable and efficient a reflex as any to be bought. Nevertheless, the Apem reflex, which we have had through our hands during the last week or two, is a thoroughly reliable instrument, and, moreover, one which pays due regard to the considerations which are of most practical importance in the successful use of a reflex. The camera is of the single extension type, excellently rigid with the lens front at its maximum distance of about 8½ inches from the plate. It can be used with certain lenses of as short a focal length as 5⅜ inches, while as regards the needs of those photographers requiring a long focus, it is easy to fit one or other of the fixed-focus telephoto lenses, giving an

equivalent focal length about 1½ to 2 times the camera extension. The introduction of these lenses, of aperture from about f/5 to f/8, may be said to have disposed of the necessity of a double extension in a reflex, or, in fact, any other hand-camera. The lens front of the Apem has nearly 1 inch rise and ½ inch fall, and the lens itself is provided with a cover of ample size, which automatically springs up when released and then forms a sky shade. The hood is of good design, 6¾ inches high, and affords a clear view of the focussing screen. We are glad to see that the makers have made the focussing screen instantly accessible for dusting. In our considerable experience with a reflex camera, this is one of the movements that is most frequently required. In carrying about a camera throughout the day the settling of dust on the focussing screen is the chief cause of any difficulty there may be in the sharpest focussing. In the Apem the focussing screen itself is also quickly removable, giving access to the mirror for the dusting which, in its case, is much less frequently necessary.

The mirror is one of the self-falling variety, but remarkably smooth in action and requiring a very much lighter pressure to raise

it than many in cameras of this type which we have used. Reversing of the plate (into the horizontal or upright position) is obtained by means of a detachable square back.

The focal-plane shutter has a quite quick enough wind, is adjustable for time exposures and is fitted with the old, but simple and reliable, method of adjusting the width of slit, consisting in operating a cord which draws two ends of the blind together or allows of their being extended. Although this method of slit adjustment is slower than that of more modern types of shutter, we would as soon have it as any on account of the less complicated construction of shutter which it permits. In finish the camera is of good appearance, covered in black leather cloth, with most of its metal parts of semi-glossy black finish. Without lens, but including three single metal-holders, its price is £9 9s. At £10 10s. it is fitted with an f/5.9 Wray Lustrar, whilst other lenses may be fitted up to a price of £21 15s., which is the figure for the camera fitted with a Ross f/4.5 Xpres.

Developing and Fixing Tanks.—Messrs. Otter-Judge & Co., 45-47, Rudyard Road, Sheffield, offer a set of vertical developing, fixing, and washing tanks, which have many of the special qualities demanded of such articles. The tanks are made of 22-gauge lead, tested for leakage, and are then sunk—by a special process—in a case of selected seasoned timber. The case is cemented with an impervious cement, and is itself water-tight. The inside dimensions are 42 in. x 9 in. x 8½ in.; capacity, 10½ gallons; developing 250 spools in one bath. The developing tank and fixing tanks are fitted with brass taps; the washing tank can be fitted with a syphon tube of small or large diameter, as required for slow or rapid outflow. Although strongly made the tanks are quite portable—weight about 56 lbs.—and are well designed. The bottom of the tank is protected by prolongation of the sides, and the whole constructions is such that accidental breakage is impossible. The lead lining deserves special mention; the makers experienced difficulty in securing a suitable lead, but persevered until they obtained one with a remarkably smooth surface, and the tank submitted for our inspection left nothing to be desired in this respect. The tanks are listed at £9 9s. per set of three, complete and carriage forward, and the makers are prepared to quote for other sizes.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

Monday, April 24.

City of London and Cripplegate P.S. "Composition." M. O. Dell.
Southampton C.C. "Some French Cathedrals." E. N. Ellis.
South London Photographic Society. "London from Many Points of View." B. Creighton-Beckett.

Tuesday, April 25.

E.P.S. Gelatine. Dr. T. Slater Price.
Bournemouth C.C. "Pictorial Ideals." M. O. Dell.
Cambridge Phot. Club. "Through the Grecian Archipelago with a Butchers' Reflex Camera."
Exeter Camera Club. Set Competition.
Hackney P.S. "Landscape Photography." E. C. Ridge.
Nottingham Phot. Soc. "What is Correct Exposure?"

Wednesday, April 26.

Borough Polytechnic P.S. Rummage Sale.
Croydon C.C. "Home Portraiture." A. F. Catherine.
Dennistoun Amateur P.A. "A Talk on Cameras."
Ilford Phot. Soc. Annual Meeting.
Partick Camera Club. Annual General Meeting.
Photo-micrographic Society. Members' Evening.
Rochdale Amateur P.S. "Tips and Dodges."

Thursday, April 27.

Gateshead Camera Club. Members' Night.
Hackney P.S. Outing: Roydon to Broxbourne.
Hammersmith Hampshire House P.S. "Versatility." The Composition of the Photographic Picture. R. H. Lawton, F.R.P.S.
Optical Society. "The Mechanical Construction of the Microscope, from a Historical Standpoint." Prof. A. Pollard.

Friday, April 28.

South Shields P.S. Annual Meeting.

Saturday, April 29.

Dennistoun A.P.A. "Cathkin Braes." W. MacPherson.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday April 11. The president, Mr. W. I. F. Wastell, in the chair.

Dr. Henry B. Goodwin, of Stockholm, delivered a lecture entitled "Photographic Portraiture, Pure and Simple." It was an outspoken expression of his views on the recent tendencies in photographic portraiture and figure-study work. Although a member of the London Salon, Dr. Goodwin strongly dissents from a large part of the policy which is reflected each year in the exhibition, and, it would seem still more so from the choice of examples of pictorial photography which find a place in "Photograms of the Year." He dwelt emphatically upon the baneful effect of those pictorialists who have shown great theatricality in their work. While not exactly saddling the late Rudolph Duhrkoop with the genesis of this school, he was inclined to attribute the straining after theatrical effect to a misunderstanding of the misconceptions of Duhrkoop. The gist of his criticism was applied first to the kind of thing he called "theatrogram," a rendering of an actress, dancer, or cinema star, the characteristics of which were created in the subject, and owed nothing to the photographer's discernment and interpretation of natural beauty. They were simply stages, made up productions, the output of a mind exclusively concentrated upon style.

He quoted Mr. Herbert Lambert's definition of simple portraiture, namely, one which produced a certain feeling of rightness and inevitability, and he showed in contrast therewith some specimens of modern "theatrograms," another name for which he had coined viz. "choreographic arms." Another modern vogue which came under his criticism was "adulterated portraiture," quasi-portraits, but adulterated by fancy lighting, stagey posing, loud

backgrounds, or all of them together. Dr. Goodwin showed some examples of the way in which all character rendering had disappeared from the portraits of several sitters of note by indulgence in these methods; on the other hand, he had a few examples to show of works of artistic simplicity by Luboshez, Madame d'Ora, Pirie Macdonald, and Nicola Perscheid. The last-named had been a great benefactor and friend to some photographers in Scandinavia by his lectures and courses of lessons.

He urged that the portrait photograph should emulate the well-written story as distinguished from a police-court report. Future generations would expect photographs to be reliable human documents, revealing the characteristic look of the personality. Yet the works of fashionable portrait photographers fell infinitely below this aim. Dr. Goodwin instanced a portrait of Jenny Hasselqvist, the greatest Scandinavian dancer, made in London, and largely published, which utterly failed in rendering the extraordinary psychic and physical beauty of her face. The remedy for the harm which was being done to photography by the spurious works of the ignorant and the arrogant was a return to the study of nature and the study of life.

A discussion followed, in which Messrs. Herbert Lambert, F. C. Tilney, Marcus Adams, Dudley Johnstone, W. Thomas and the chairman took part, and a most hearty and appreciative vote of thanks was accorded to Dr. Goodwin by acclamation.

LANCASHIRE SOCIETY OF MASTER PHOTOGRAPHERS.

The members of the Society assembled at the studio of Mr. Percy Guttenberg, 40, Oxford Street, Manchester, on April 5, by kind invitation of the proprietor. The proceedings opened with a short business meeting, which was presided over by Mr. Arthur Winter, president of the Society.

The secretary reported that at the committee meeting held that day arrangements had been made to hold an exhibition of photographs in conjunction with the Trades' Exhibition to be held at Blackpool on May 15 to 20, and a sub-committee had been appointed to take charge of the same.

The date of the annual meeting was fixed for May 17, and the trade dinner will be held on the evening of the same day. During the run of the exhibition several demonstrations will be given. Particulars of these will be fully reported at a later date.

The secretary reported that a number of new members had joined the Society since the last meeting, and the treasurer's report was a very satisfactory one.

The president (Mr. Arthur Winter) stated that Mr. Lang Sims was honouring them by a visit, and he introduced him to the members. Mr. Lang Sims stated that he felt honoured to be given the privilege of saying a few words to them, and would like to take the opportunity of explaining his position with regard to the P.P.A. As was well known, he had recently resigned his position as secretary, but he would like it to be distinctly understood that he was on the best of terms with the Council, and he had been unanimously elected a member of that body. His object in visiting Manchester was to meet as many members as possible of the P.P.A., and to ask for their support for the Conference which will be held in London in the month of September. He had been associated with the P.P.A. from its very inception, and had seen a number of local societies come and go, but he congratulated the Society of Master Photographers on being the only local society that had lived. He did not think that they had in any way interfered with the work of the P.P.A., as their organisation was a purely local one, whereas the P.P.A. was national, and he knew that a large percentage of their members were also members of the P.P.A.

He was pleased to inform them that very shortly the P.P.A. would be in a position to issue a monthly journal, and, should the Society desire any assistance so far as that journal was concerned, he felt certain the Council would be only too pleased to help them. He hoped that the members of the Society would do their best to arrange to be present at the Congress in September, as it would be purely of a professional nature, and they hoped to have an international exhibition, which would be of great interest to every professional photographer. He thanked them for the kindly welcome that they had given him. It was the first opportunity he had had of meeting the members of the Society, and he hoped at some future date to renew their acquaintance.

The president, in thanking Mr. Lang Sims for the information he had given with regard to the Congress, promised that the members would support the P.P.A. in every way possible. He then called upon Mr. Percy Guttenberg to give his address on "How to Conduct the Modern Studio."

Mr. Guttenberg stated that in considering the question of "How to Conduct a Studio" he would start from the window or showcase, and impress upon the professional photographer the necessity of giving these his close attention. He called attention to his own window, which was illuminated with very bright lights, and he took advantage of every opportunity to make a good show at night. The lights in his window were so arranged that they not only illuminated the sign in the window, but helped to light the reception room. The lights were hidden from view, and the window was always attractive. In his opinion, the specimens in the window should be frequently changed, and he thought it a good idea to have specimen prints done at the same time as the customer's order; if not, they were never done. This would give a ready supply of fresh prints. So far as his window was concerned, it was changed daily, not necessarily with new specimens, but the positions of the specimens in the window were altered.

With regard to the question of dealing with customers, more often than not people come in and say, "I don't know what I want." This is the opportunity for the receptionist. His personal experience was, the fewer specimens you submit the more successful you are in getting the best out of your customer. This was a "golden rule" in every business. They should begin by showing the most expensive, and only go slowly to the cheaper ones. When people call in to make an appointment, and not to sit immediately, reverse the order of things, and show them the cheapest styles, trusting to do better when they come for their sitting.

Proceeding to describe his business methods, Mr. Guttenberg said:—

"We keep an appointment book, and an appointment card is given in each case. Nearly the whole of our orders are cash at the time of sitting, or, in the case of copies or enlargements, the time of ordering. All enlargements are quoted without frames; by so doing it lessens the first cost. When sending a written quotation for enlarged portraits, send measurements of actual picture only. Point this out distinctly, because if it is in competition someone else may include outside edge of mount, and, in consequence, the other quotation may appear better value.

"Each of our customers has a registered number. This number is quoted on the negative, and on all correspondence, etc. For reference we also keep a 'reminder book,' which is dated, and all special orders or promises are entered into it.

"A ticket is given to the operator with a registered number on and particulars of order. This number is put on the plates, and any details that the clients may ask the operator in regard to proofs or otherwise is referred to the receptionist, a telephone being fixed from the reception room to the studio. The negatives, when developed, are sent upstairs each morning for naming and numbering. Retouched, but light and unfinished, proofs are always posted in from six to seven days, and, when returned, are marked on the back with the number required. The date of the return of proofs is also entered with the original order. This saves any disputes. We take about sixteen days to complete, but we are in a position to complete one dozen 11 × 7 sketch portraits in twelve hours if absolutely necessary.

"Our work is mostly called for if within reasonable distance, and our customers are advised when they are ready. The saving of postage by this means is very great, and sometimes leads to other business, as the oftener you can bring your client to the studio, the better. All proofs and orders are sent to the works at 5 p.m., and are passed through a duplicating book, and the order sheets are returned with the complete work. No verbal orders are permitted or given, and there is no saying, 'You said this' or 'I said that.' We keep a negative register, which is most necessary to trace up negatives for re-orders, or to see from the books what the clients had previously. This is also a general guide as to all previous transactions.

"My works are connected by a private telephone, and are only a few minutes away; it is there we do all paintings, printings, retouchings, and mounting, etc.

"My books are kept by chartered accountants, who attend on

the seventh day in each month, to write up all accounts. A balance-sheet and profit and loss account is prepared each year, so that we can see at a glance what has been spent on rent, rates, salaries, mounts, plates, postages, etc., and we compare and correct or stop if there is an undue increase. I pay all my accounts on the 28th of each month, and never lose a discount, and it is surprising what these discounts mean and amount to.

"The studios are open from 9 to 6, Saturdays 9 to 1. Punctuality in opening and closing are of vital importance, and I am most particular as to this. We have a contract for the cleaning of windows, which is done every morning outside and twice a week inside, but is dusted inside twice a day. We keep two cleaners, and they are always busy attending to some portion or other of the premises.

"I draw your attention to the fact that you will not see any accumulation of old accessories or frames or rejected negatives, as I scrap anything that is useless, and replace immediately any plant that can be bettered. In conclusion, I would like to say a word about invitation sittings. I feel very keenly about this, and so did my father. He commenced business in Bristol in 1845. We have thus been established 77 years, 45 of which has been in Manchester, and I can thus claim to be one of the oldest firms in the profession. I am very proud of that fact, and can honestly say that, as far as I know, and certainly not in the last 30 years that I have been in business, we have never given an invitation sitting, so much so, that the photographs taken of the King and Queen, the Prince of Wales, etc., were ordered and paid for by the city. If the members of the trade would abolish invitation sittings, it would add greatly to the dignity of the profession of photography."

During the evening Mr. Guttenberg gave a demonstration of posing and lighting by artificial light. His studio is so arranged that lighting effects can be demonstrated in any part of it, the result being that backgrounds are dispensed with and different sections of the studio are utilised in place of them.

The exposures were made on flat Eastman films, as Mr Guttenberg uses nothing else in his studio.

Several prominent members of the Society acted as models, and specimens of the results were shown to members before the close of the meeting.

Mr. Percy Guttenberg concluded his address by stating that he had for the past 27 years been greatly indebted to his wife for the great assistance she had been to him in his business, and they had been true partners all through their married life.

At the conclusion of Mr. Guttenberg's address, Mr. Fred Read proposed a vote of thanks to Mr. Guttenberg for his address, and to Mr. Lang Sims for his remarks with regard to the P.P.A.

Mr. N. S. Kay seconded the vote of thanks, and it was carried unanimously.

The President called upon Mr. Lang Sims to reply on behalf of himself and Mr. Guttenberg, and Mr. Lang Sims having suitably replied, a most successful meeting held by the Society terminated.

CROYDON CAMERA CLUB.

Kindly changing dates with Mr. Reynolds (billed for "Colour Vision"), Mr. J. W. Purkis, at short notice, discoursed on "Platinotype in a Test Tube," and succeeded in bringing home to the least scientific of his audience the main principles underlying the process.

To follow the lecturer through the instructive experiments conducted, and allude to the results of others passed round, would involve a treatise on the subject, and will not be attempted. Very clearly he explained that platinotype paper is coated with two salts, one a salt of platinum, which is practically insensitive to light, and the other a light-sensitive iron salt, which on exposure to daylight undergoes a definite and visible chemical change, being converted from the ferric to the ferrous state. The initial iron picture thus formed in the act of dissolving in the developer reduces *in situ* the platinum salt to metal proportionally to the original light-action. The residuum of salts left in the paper is removed by weak acid baths, and a short wash completes operations.

Quite a feat was the preparation of a sheet of platinum paper; its exposure behind a clear-glass thin negative to ignited magnesium ribbon, and the production of a print all well within ten minutes. Not an inexpensive experiment either, with a 15 gr. tube of the platinum salt priced at 7s. 6d. In point of "quality" the print left something to be desired.

This led Mr. Purkis to emphasise the fact that a wide gulf yawned between laboratory experiments and the high-grade commercial article of consistent uniformity. In his opinion far too little recognition was afforded the men who by scientific methods patiently and laboriously evolved the many almost perfect products of the present day.

In the discussion the first blast from Mr. Harpur woke up with a start an elderly visitor who had peacefully dropped off to sleep. Mr. Harpur made various suggestions for improvement in platinotype procedures, which at least possessed the merit of originality. The vapour from a bottle of hydrochloric acid, accidentally left unstoppered, combined with an equally fragrant drift from the president's cigar having reached the secretary's nostrils, here caused a momentary change of subject. Next came a consideration of the respective advantages of rubber pads, American cloth, celluloid, oil-silk and old sausage skins as damp-proof backing for the paper during printing, the balance of opinion being in favour of the first-named.

Mr. Salt congratulated the lecturer on an admirable exposition out of the ordinary rut; chided him for calling the clearing baths "fixing baths," and pointed out that although the paper should be kept dry in all stages, only reasonable precautions were demanded. Paper, however, required to be stored, i.e., should not be allowed to absorb damp. A most hearty vote of thanks was accorded Mr. Purkis for a lecture which must have involved much preparation.

Commercial & Legal Intelligence.

LEGAL NOTICES. Notice is given, pursuant to Section 242 (3) of the Companies (Consolidation) Act, 1908, that, at the expiration of three months from April 11, the names of the undermentioned companies will, unless cause is shown to the contrary, be struck off the Register of Joint Stock Companies, and the companies will be dissolved:—Essex Photographics, Ltd.; Keystone Art Company, Ltd; Life Portraits, Ltd.

NEW COMPANIES.

E. GOULD & SON, LTD.—This private company was registered on April 5, with a capital of £100 in £1 shares. Objects: To carry on the business of chemists, druggists, photographers, etc. The provisional directors are: J. S. Stooke-Vaughan, 12, John Street, Bedford Row, W.C., solicitor; A. Wilson, Bourne Farm, Bexley, Kent, secretary. Registered office: 35, Moorgate Street, E.C.2.

OPTEX, LTD.—This private company was registered on April 6, with a capital of £100 in £1 shares. Objects: To carry on the business of opticians and makers of photographic appliances, etc. The first directors are: T. Edwards, 233-5, Queen's Road, Battersea, S.W.8, manufacturer; H. R. Herbert, 126, Barry Road, S.E.22, merchant. Secretary (*pro tem.*): H. R. Herbert. Registered office: 45 and 46, King Street, Cheapside, E.C.

GRAPHIC ENGRAVERS, LTD.—This private company was registered on April 6, with a capital of £2,000 in £1 shares (1,000 ordinary and 1,000 preference). Objects: To carry on the business of engravers of photographic or any other process, etc. The subscribers (each with one share) are: G. T. Cooke, 22, Broad Street, Bristol, solicitor; O. G. Cooke, 22, Broad Street, Bristol, solicitor. The subscribers are to appoint the first directors. Secretary: J. W. Corrigan. Registered office: Westown House, Brislington, Bristol.

GEORGE E. GIBSON, LTD.—This private company was registered on April 6, with a capital of £1,000 in £1 shares. Objects: To take over the business of a chemist formerly carried on by G. E. Gibson at 359, Portswood Road, Southampton, and to carry on the business of dealers in photographic supplies, etc. The first directors are: A. E. Popplestone (governing director), 55, St. Denys Road, Southampton; Mrs. Alice M. Popplestone, 55, St. Denys Road, Southampton; S. E. W. Martin, 89, Bullar Road, Southampton. Qualification: One share. Registered office: 359, Portswood Road, Southampton.

CLARENDON CHEMICAL CO., LTD.—This private company was registered on April 6, with a capital of £1,500 in 1,000 "A" shares of £1 each and 10,000 "B" shares of 1s. each. Objects: To carry on the business of chemical and drug manufacturers, manufacturers of and dealers in photographic apparatus, etc. The first directors are:

E. Todd, no address stated; J. K. Watson, Wivelsfield, 116, Kew Road, Richmond, Surrey; T. H. Forteath, no address stated; E. Cohen, Finsbury House, Blomfield Street, E.C. Qualification: One "A" or one "B" share. Remuneration: £250 each per annum (chairman, £100 extra), free of income tax up to 6s. in the £. Registered office: Finsbury House, Blomfield Street, E.C.

News and Notes.

STOLEN CAMERAS.—Several binoculars and cameras, valued at £140, were stolen during the week-end from a house in East Dulwich by thieves, who entered the house by breaking the glass of the fanlight.

ROYAL INSTITUTION.—On Thursday (April 27) Professor E. H. Barton delivers the first of two lectures on (I.) "The Resonance Theory of Audition"; (II.) "A Syntonic Hypothesis of Colour Vision."

CAMERA SMUGGLING AGAIN.—For smuggling four watches, a camera and parts of cameras, the Dover magistrates last Saturday imposed a fine of £134 on a Japanese Channel passenger, stated to be director of a company.

THE CAMERA EXPLAINS RELATIVITY.—A Reuter telegram from Berlin announces the publication of a trick film, 9,000 feet long, to illustrate the Einstein theory. The photographic work has taken six months to perfect, and the object of the picture is to make clear to the lay mind various facts in the domain of physics and light which lie at the root of the relativity theory.

THE BRIGHTON POST OFFICE CAMERA CLUB has recently been formed, and the thirty-eight members are mostly beginners. Under the guidance of Mr. A. Deane, the Club is concentrating on the elementary processes of negative making and printing. A convenient dark-room fitted with a ½-pl. enlarger and accessories has been provided for the use of members. The Honorary Secretary is Mr. Albert Gill, 35, Stanford Road, Brighton.

RACE TRAFFIC PHOTOGRAPHS.—Last year, it may be remembered, a large series of photographs was taken from the air of the traffic going to the "Derby" and other races at Epsom. The authorities now state that such pictures have enabled them to remodel many traffic regulations and to make many improvements in the diversion of traffic at the numerous cross roads where congestion occurred. Aerial photographs will again be taken of any congestion *en route* as well as progress of the traffic at specific times before and after the races.

SIR ROSS SMITH AND PHOTOGRAPHY.—Sir Ross Smith, who was killed at Brooklands last Thursday in an aeroplane accident, played an important part in aerial photography during the war in Palestine. At one time (the "Daily Telegraph" states) the British advance upon Jerusalem was held up by difficult country. The old maps were of very little use, and the Air Service had to prepare new ones. An order was issued one night, and the next day two Australians, Lieut. (later Sir) Ross Smith and Lieut. Austin, photographed from the air an area of thirty-seven square miles, the work enabling the staff to organise an advance, and five days later our troops had driven the Turks from the precincts of the Holy City.

FLASHLIGHT PHOTOGRAPHY FETCHES FIRE BRIGADE.—The taking of flashlight photographs in a warehouse in London Wall last week resulted in a false alarm of fire and the appearance of six engines and escapes. A similar incident occurred at a flashlight demonstration given at the old London and Provincial Photographic Association about twenty-five years ago (writes a correspondent). A kindly-disposed passer-by seeing the brilliant light and the smoke —and there was smoke from magnesium in those days—gave the alarm, and in a few minutes the harmony of the meeting, as well as the demonstrator's discourse on the advantages of flashlight, was interrupted by the rattle of fire engines outside and the appearance of firemen at the door.

PHOTOGRAPHY OF FASHIONS AND MODELS.—A correspondent who was particularly interested in our recent article on "The Problem of the Model," sends us some extracts from a special article which appeared in last Saturday's "Daily Telegraph." The writer of the article had the cinematograph camera in mind when penning the note, but his remarks apply equally well to the ordinary camera. In the article it is stated that announcement has been made of a more extended use of the cinematograph for the purpose of displaying the latest models in dress as they appear in wear. The idea is put forward as a novelty, and as showing the developments of the practical application of the film to everyday requirements. But the suggestion is hardly as new as is claimed. It has been tried in connection with exhibitions dealing with fashions, and it has been found wanting in at least two highly important directions. Colour, in the first place, cannot be shown to any appreciable extent in this way, and every woman knows the part that is played in the success of a toilette by having the correct and appropriate tones, whether of the material itself or the accessories in trimmings and embroideries, into which harmonies and contrast are effectively introduced. Again, the film cannot convey the right sense of the texture of the material employed. A cheap muslin and a costly crêpe marocain, a rich velvet or a mere shoddy tweed, would present little difference on the screen.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

PORTRAITS AND THEATROGRAMS.

To the Editors.

Gentlemen,—I was present at Dr. Goodwin's lecture, but could not agree with all he said. Portraits and "theatrograms" are not the same thing, so you cannot judge them in the same way. Chiffon and velvet are both materials and each is good of its kind, but chiffon velvet is both, and is perhaps more beautiful.

Last week at Mr. Lambert's lecture we had two slides of Rodin: the first a bad portrait, the second a very fine "theatrogram." The one photographer "played" (?) with his light to a much greater advantage than the other used his 45 degrees. The best of all portraits are also theatrograms; they are thoughtfully staged to emphasise the personality of the sitter.—Yours,

MAUD BASIL.

100, Tottenham Court Road, London.

THE "R.P.S.": ITS EARLIEST TROUBLES.

To the Editors.

Gentlemen.—Your editorial note on the many flittings of the (now) Royal Photographic Society reminds me of some of its earliest troubles, difficulties, curiously enough, brought about by the (now) "B.J.," and also Fox Talbot, to whom the Society is to institute a memorial. The story was told me some years ago by an octogenarian photographic celebrity who knew all concerned, and your pages are, I consider, a suitable place to record some curious facts not generally known.

Roger Fenton was, it is believed, the real founder of the Society; he was its first hon. secretary, and it was he who got together a few workers to discuss the matter, the meeting being held during the winter of 1850 at the offices of "The Art Journal," a publication which was then paying photography particular attention. This initial attempt to form a society was a failure, though many of the enthusiasts continued to meet, as they had been meeting, unofficially and without rules.

The reason of the failure makes curious reading to-day. It was due to the existence of certain patent rights held by Fox Talbot, rights exercised in such a way as to preclude all hope of forming a really good society. The enthusiasts took no further steps until 1852, when a deputation was appointed to bring pressure to bear on Fox Talbot. The deputation was a very influential one, Sir Charles Eastlake, president of the Royal Academy (and afterwards

first president of the Photographic Society), playing a prominent part; another member of the depntation was Lord Rosse, president of the Royal Society. To the deputation, and particularly to the two gentlemen named, do we owe the partial waiver by Fox Talbot of his rights or claims, and the foundation of the Photographic Society of London, which afterwards (1874) became the Photographic Society of Great Britain, and later (1894) the Royal Photographic Society.

The inaugural meeting was called by advertisement in the leading newspapers for January 20, 1853, and it was held at the Society of Arts. At the end of the first year the number of members was 370, and the receipts £645. The first exhibition of pictures was held in January, 1854, and was visited by Queen Victoria and Prince Albert.

Another little known fact is that concerning the clashing of the Society's "Journal" with your own. The Society brought out the first issue of its journal—called "The Photographic Journal"—on March 3, 1853, and its circulation grew rapidly to 4 000. Then in 1859 the Liverpool and Manchester "Photographic Journal" (which started in 1854) came to London, dropped the names of Liverpool and Manchester from its title, and came out as "The Photographic Journal." Naturally there was trouble and legal proceedings were taken, a Mr. Bohn being appointed arbitrator. The latter decided in favour of the Photographic Society, and your journal, as you no doubt know, was compelled to find a new name—the one it bears to-day.

Most of the facts recorded above are probably well known to the older generation of your readers, but I have an idea that the story of the Fox Talbot trouble will be new to them.—Yours faithfully,

G. W. B.

PERMANGANATE FOR HYDROQUINONE STAINS.

To the Editors.

Gentlemen,—While I can endorse all you say in last week's "B. J." (p. 224) concerning the removal of hydroquinone stains by means of the Ilford solution, I would like to point out that slight stains, particularly upon lantern plates, may be removed by use of a plain but very weak solution of permanganate alone.

Many years ago, when visiting the Paget Works at Watford, I witnessed the making of some lantern slides by their expert, Mr. W. J. Wilson. A hydroquinone developer was used, and there was a brownish stain over some of the high-lights of the slides, and on my commenting upon this defect, Mr. Wilson took a few grains of permanganate and dissolved them in water so as to make a light pink solution; the slides were then immersed in the solution for a few minutes, when the stain vanished, he telling me that the dodge was then not generally known.

On many occasions since that demonstration I have removed slight brownish (hydroquinone) stains from slides in a like manner, also from negatives, but stains upon the latter always appear to be more deeply embedded, and more difficult to remove, than stains on slides. Anyway, the remedy is simple and cheap enough and well worth a trial, but care must be taken to have the solution weak, and certainly not of a deep, or even a medium, pink colour.—Yours faithfully,

S. T. RAWNHAM.

PRESENT-DAY TECHNICAL QUALITY.

To the Editors.

Gentlemen,—In your "Ex Cathedra" Notes of March 10 there is a short article on fixing bath for bromides, which, if carefully followed, would be valuable for those who desire good technical quality and colour in their negatives.

But meanwhile let me say that I consider your leader on the above subject very stimulating for those, like myself, who win their daily bread by photography. It is hard to say what Dr. Glover means by the school to which he belongs. If he is writing for a few select aristocrats, well and good; he has every freedom to do so, but the great majority of photographers would not understand him. If he is to use his ability and learning for the profession he will have to come down a good bit before he can uplift those benighted men who are in the desert with stickybacks and postcards. Certainly Dr. Glover has a marvellous way of expressing a simple fact. In his own language, "The magnitude of the range of light-intensities." Now the blocks in my school would "sling their lamps" on clear glass and good or full density, and say, "Here, Alf, print this negative on any paper you please!" Of course, Dr. Glover will excuse these vulgarisms, because they were suggested by his own letter, and because I was brought up in a school that had only one plate, one developer and one printing paper.

If a negative was thin in those days they brought it up with a few drops of silver and iron to standard strength, and I don't think that they will invent any instrument to beat a good human eye at judging density.—Yours faithfully,

HENRY HOLMAN.

Banff.

To the Editors.

Gentlemen,—Your leader of the 7th, and Dr. Glover's commentary, illustrate the difference between practice and theory, a difference which can only be appreciated by those who depend on practice for their daily bread. While not ignorant of the theoretical facts expounded by Dr. Glover, I agree with your views, and I do so because I have lived photography all day and every day for a good many years. I don't think Dr. Glover can say this; if he could, he wouldn't be a doctor.

He asks, "Can it be seriously suggested that a negative can be so excellent that it will both yield a good print on vigorous gaslight paper and P.O.P.?" Well, what is wonderful about it? Years ago I used a vigorous P.O.P. for thin, soft negatives, and a soft P.O.P. for harsh negatives, and they were equal to any gaslight papers. And why does Dr. Glover say *gaslight?* Perhaps he would be surprised to know that in trying to make pictures for the public from bits of clear celluloid I use *bromide*, not gaslight, and I do not find a want of vigour.

The P.O.P.s mentioned were supplied by Messrs. Griffin and Messrs. Rajar respectively. I cannot say whether they are still obtainable, but grades of vigour are not monopolised by gaslight paper. Had the question been: Can a negative be so excellent as to render good prints from gaslight, bromide, P.O.P., platinum or carbon, without any mention of "vigorous"? I should say that it did not require to be excellent; it only needed to be of the old professional average to do all that.—Yours sincerely,

31, August Road, Liverpool. J. R. HALL.

SYSTEM IN HALF-TONE OPERATING.

To the Editors.

Gentlemen,—Mr. Bierman's note on "System in Half-Tone Operating" raises some interesting points, and I should like to contribute a few notes on his ideal and the two systems which he criticises. Mr. Bierman's ideal is evidently, and quite soundly, based on the scientific and practical principle that the system which involves the alteration of the smallest number of factors is best, unless very great advantages can be proved to result from more complicated methods.

While a system must be very bad before it is equal to no system at all, the Douthitt System seems to depart very far from the ideal stated above, and, in doing so, introduces other objections. Taking the figures given by Mr. Grenell in the "Process Year-Book" as reliable data, I may mention only two curious points.

In the first place, the stop to be used grows rapidly smaller as the screen ruling becomes coarser, when the need for extreme definition becomes less. The second point is the increase in exposure necessitated by small stops. To put it in a more practical way, one would require to be convinced of an enormous improvement in results to be reconciled to giving a "rush" coarse screen (50 line) negative *nine times* the exposure which the same original would require with 150 line screen; or after having done the above newspaper job with a stop equal to *f*/100, to be expected to do an extremely fine job, requiring a 200 line screen, with a stop equal to *f*/25!

With regard to the system of Messrs. Smith and Turner, I think Mr. Bierman is in error in attributing change of stop size with change of screen to them. The fault I have with their system is due partly to the factor which Mr. Bierman has been working on, namely, diffraction. I have been working at the same subject, but not in measurement, which I am inclined to regard as of little use in practice, as the average operator and the average camera are not equal to working to sufficiently exact limits.

Diffraction plays a very important part, but so do several other less calculable factors, such as effect of the glass and balsam, minute differences in width of line, and so on, so that careful working

reveals differences in the working screen-distance of paired screens oven by the best makers.

The system which seems most practical, although to the mathematical mind it may be unsatisfactory, is to keep the stop a constant fraction of the extension, and to find out, once for all, for each individual screen, the distance at which it gives the best result, after which it is a simple mechanical problem to ensure that this distance is employed whenever this screen is used.

There are many other interesting points suggested by Mr. Bierman's article, and by consideration of the figures which Mr. Grenell has published, particularly from the point of view of diffraction, but this letter is already sufficiently lengthy.—Yours faithfully,

Edinburgh. W. B. HISLOP.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

F. O'BRIEN.—The only lamps for high-power light, apart from gas or electric current, are the incandescent paraffin mantle lamps of either the Kitson Empire Co., Stamford, Lincs., or Blanchard Lamps, Ltd., 151, Farringdon Road, London, E.C.1.

R. B.—A good cement for fastening metal to cloth or other fabric may be made by dissolving gelatine in acetic acid till it is about as thick as cream. This, unlike other glues, does not shell off the metal when hard. The solution is made without heat and remains liquid at ordinary temperatures.

L. J. BOON.—The yellowish marking on the print is evidently due to faulty fixation, that is to say, the whole of the print has not been fixed, probably owing to omission to keep the prints moving and separated from each other while in the fixing bath. A fixing bath which has been used for too many prints favours the defect.

J. S.—In most cases the bloom will easily come off on rubbing with ordinary indiarubber. A soft rubber suffices with some prints, and is really the only one it is safe to use, although with care a harder rubber may be used for obstinate cases. Another means is to use the very fine abrasive preparation made by the Vanguard Manufacturing Co., Maidenhead, as "Frictol." We have used this with good results.

H. T.—So far as we know there has not been a copyright case in the Courts at all corresponding with the circumstances you mention. The case is a rather doubtful one, but our opinion is that in the absence of any definite provision the copyright in the negatives would remain the property of the firm after the operator had left, in which case, of course, the employee could not restrain the firm from issuing prints from the negatives

K. P.—So far as copyright law is concerned, you are at liberty to take and supply a second set, even though the views turn out practically the same as the first lot, but under common law it is quite possible that your contract with either one or other of the two customers would be held to be broken on account of the similarity between the pictures. Both legally and morally you will be well advised to make the views substantially different.

P.—We are not surprised that half-watt lamps were found ineffective, as these are perhaps the least suitable for iron papers. We do not profess to know what arcs are like in the old pattern Halden machine, but we think it very likely they are of a very antiquated type. We think it would be worth while to have them replaced by modern enclosed arcs, the best of which for this work are those of the Westminster Engineering Co., Victoria Rd., Willesden Junction, London, N.W.10. We are sure this Company would give you quite candid and reliable advice in the matter.

M. P.—It is difficult to assign an exact position for the diaphragm, but judging from the Aldis cemented lens or the Cooke lens, which closely resembles yours, it should come behind the centre negative lens at the point we have marked on your diagram (returned). Your best plan would be to cut a card diaphragm, say, *f*/11, and move it to and fro in the tube till you find the best position. The difficulty of inserting a Waterhouse diaphragm can be surmounted by making a tube adapter or sleeve (as we show on diagram) to bring the whole of the lens outside the camera. The slot could be cut through this as well as through the original tube.

B. F.—(1) Bolting silk is quite satisfactory for certain diffusion effects, but it must be used within an inch or two of the paper, not anywhere between the lens and the paper. If you use fine chiffon, on the other hand, you can fix it on the lens hood. (2) You are working on a very wrong plan as regards the fixing bath, and we are not surprised that you get blisters. Make up the bath with alum, sulphite, hypo and acetic acid, according to the fixing-hardening formula of almost any maker of bromide or gaslight paper. (3) Blue spots are generally caused by particles of iron in the wash water, or sometimes from bad samples of alum. We advise you to tie a flannel filter over the tap, and if there is any reason to suspect the alum get a reliable supply from a chemical firm of repute.

C. G.—Impossible to answer all your questions because you do not even say what are the sizes of the tanks, or what the material (plate or film) which you are developing. However, our opinion is that you must, of course, have a water tap over the washing tank, and it would be a great convenience to have another water tap for rinsing negatives as they come from the fixing. Certainly you should have a sink in which the fixing tank and the washing tank stand. The developing tanks should be on a bench adjoining, at least 6 to 7 ft. from the fixing tank. Height of bench and height of sink should be such that the tops of the tanks come at about waist level. Have a red lamp with switch for the development work, and a white light (behind a sheet of opal glass) immediately over the sink for convenience in examining negatives without the danger of letting hypo splash on the floor or elsewhere.

J. S.—The particulars given in your question are contradictory. If the customer ordered and paid for the portraits, the copyright became automatically his, and is almost certainly still his at the present moment. The only way in which it could have lapsed altogether is through the photographer having died at such a time that the term of copyright had come to an end before the present Act came into force. As the present Act came into force in June, 1912, it is hardly likely that the copyright has expired. This being so, we are unable to understand what you mean by saying that the customer was refused the right to have them reproduced elsewhere. If the copyright was his, he had a perfect right to have them reproduced by whom he liked. The explanation may be that the sitting was what is known as a "free sitting," that is in response to an invitation on the part of a photographer, and that the "order" was for prints supplied subsequent to the sitting.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. PRICE FOURPENCE.

TERMS OF SUBSCRIPTION POST FREE.

UNITED KINGDOM OR CANADA.—*One Year*, £1 1s. 8d.; *Six Months*, 10s. 10d.; *Three Months*, 5s. 5d.

ANY OTHER PART OF THE WORLD.	*One Year*	£1 3s. 10d.
	Six Months ...	12s. 0d.
	Three Months	6s. 0d.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibits the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

HENRY GREENWOOD & Co., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3234. Vol. LXIX. FRIDAY, APRIL 28. 1922. Price Fourpence.

Contents.

SUMMARY.

The Photographic Fair, which opens on Monday next, May 1, at the Horticultural Hall, Westminster, includes a very full showing by the manufacturing and dealing firms in the photographic trade. We publish a long advance notice indicating particularly new introductions which will be found at the various stands. These include new brands of roll film, self-toning and development papers, cameras and other apparatus (at reduced prices), and many other new introductions of interest to the professional and amateur photographer. (P. 243.)

By courtesy of Mr. Arthur C. Brookes we are able to publish an advance review by Mr. F. C. Tilney of the collection of examples of portraiture by American professional photographers which will be on view at the Photographic Fair during next week. Mr. William Crooke is to judge these exhibits for the award of a thirty-guinea cup. (P. 243.)

The Congress of the Photographic Dealers' Association will be held during the Fair week. Particulars on page 253.

This week we begin the publication of a series of articles by a portrait photographer of eminence on the business side of his profession. Later chapters will deal with systems of book keeping and costing, collection of accounts, etc. (P. 250.)

In a leading article we have some hints to give on the selection of lenses for commercial photography and utter a caution against the choice of large aperture instruments of long focus. For many purposes the inexpensive long focus single lenses may be employed with advantage, whilst the telephoto lens has a distinctive usefulness. (P. 242.)

Photographers in the smaller towns could advantageously make much greater use than many of them appear to do of the various attractive styles in enlarged coloured portraits which are offered to them by the various trade firms. (P. 242.)

Some of the amenities which should be observed in photographers' written communications with their customers are mentioned in a paragraph on page 242.

A contributor gives an account of his strenuous experiences in using drain pipes for conversion into tanks for development of amateur films. (P. 253.)

Reduction in the prices of Platinotype and Palladiotype papers is announced by the Platinotype Company. (P. 258.)

The possibilities which are contained in the latest reports of the process of photo-telegraphy invented by M. Belin, of Paris, in the transmission of photographs, etc., for reproduction in the newspapers are the subject of a paragraph on page 241.

EX CATHEDRA.

The Prospects of Photography.

The strength of photography as an industry, which is to be shown next week by the important displays of goods at the Photographic Fair, is a theme which will bear a little stressing at the present juncture when complaints are not uncommonly heard of quiet conditions of business. Depressed as some branches of the photographic trade may be, it is impossible, on deliberate consideration, to take a pessimistic view of the future of any department. Portrait photography, for the time being, continues to suffer from the prevalence of unemployment and the oppressive burdens of taxation. As both of these factors tend to be relieved—and it may be expected that the next few months will show a substantial improvement in the national affairs—we are convinced that both the cheapest and most expensive grades of photographic portraiture will enter upon a period of prosperity at any rate as good as any which they formerly enjoyed. In the cheaper grades the photographic portrait has become an article of commerce in thousands of homes in which previously it had been the rarest of luxuries, whilst the higher artistic standard of the best kinds of portraiture must result in a greater patronage of photographers by the moneyed and leisured classes. Similarly, the hand camera has become the pastime of large sections of the public to whom it was previously strange, an extension for which credit must be ascribed in part to the advertisement which photographic results obtained in many ways during the period of the war. Broadly, it may be concluded that all branches of photography will share in full measure in a revival of the general trade of the country.

* * *

Photo-Telegraphy

The "Times" in its issue of Saturday last, April 22, had a column article from its Paris correspondent giving a general description of the latest results obtained in the telegraphy of drawings and photographs by M. Edouard Belin, who has been engaged upon this subject for the past twenty-five years. As previous accounts which have appeared in our own columns have shown, M. Belin had come some years ago to a practical solution of this problem, and his latest achievements now appear to have brought the process to a stage at which it promises to exert a profound influence upon the methods of collecting illustrations for the daily Press. According to M. Belin it is now possible for a Press correspondent to go to any telephone call office and connect there his little apparatus for the transmission of a photograph. On being connected in the usual way to his office, a receiving instrument is affixed to the instrument in this latter, and within the space of five or six minutes a drawing, photograph, or piece of manuscript can be reproduced in the office of the paper. The "Times" reproduces the message in the holograph of M. Briand received in Washington last

October from Paris by wireless transmission in conjunction with the Belin system. One congratulates M. Belin upon these results, not only on the ground of scientific achievement, but for the reason that we may number him among the experimenters who have been "in photography" for many years. He has always been a keen student of photographic processes and is the author of an excellent French treatise, "Précis de Photographie Générale," published in 1905.

* * *

Speculative Portraits. When one has had, as we recently have, an opportunity of looking at the many varied and admirable styles of coloured photographic enlargements supplied by the trade firms for studios of all grades of status, we are more at a loss than ever to find an explanation for the unattractive appearance of the show windows or display cases of so many photographers, particularly those in the smaller provincial towns. In the large centres competition is a goad which has its result, but where it is less active there seems to be a disposition to think that a few photographs of the kind that happen to be coming from the workrooms are all that is required for a window display. Considering the relatively low prices at which attractive enlargements in colours may be obtained from the enlarging firms, it is somewhat surprising that a greater number of photographers do not "speculate" in them. Probably if they knew of the substantial orders given by their more enterprising brethren purely for portraits of this kind, which have not been ordered by the sitters, yet, nevertheless, are found to sell readily, they would feel a greater degree of confidence and would have the satisfaction not only of making their window displays a real attraction to the passers-by but at the same time of doing so at a substantial profit to themselves. In most places a few enlargements ordered in this way can hardly be called "speculative;" they would be better described as "gilt edged." It is hardly necessary to add that ordinary discrimination must be used in the choice of the style of enlarged coloured portraits which are ordered for "speculative" sale. The range of styles, however, offered by the enlarging firms permits of very nice adjustment to the judged standard of local taste in such matters.

* * *

The Art of Letter Writing. Photographers of all people should be expected to exhibit a certain taste and aptitude in their written communications with their customers. Most of them, we imagine, have the desire of being regarded by their customers as, at any rate, considerably above the intellectual level of the ordinary shopkeeper. Nevertheless, the standard of correspondence, and even of printed letter headings, is lamentably low. The stationery problem is easily solved by giving a free hand to a printer of taste and discrimination in such work. As regards the mechanical production of the letters themselves, the use of a typewriter is to be commended to those undertaking their own correspondence unless the handwriting has both legibility and a certain style. As regards the wording itself, perhaps the most useful thing which can be said within the compass of a short note such as this is to avoid the redundancies and jargon of commercial correspondence. Let the matter be stated as briefly and clearly as is consistent with courtesy, holding aloof from such unnecessary turns of speech as "we may say," and commercial contractions, such as "same," "even date." A customer will judge a man by the style in which a letter is written as much as by anything else; and there is no conceivable reason why the most rigorous business policy should not be pleasantly clad in good English. An unforgivable sin, which we sometimes find committed, even by firms of standing, is to answer a letter by writing a few lines on the customer's communication and returning it to him.

LENSES FOR COMMERCIAL PHOTOGRAPHY.

THE photographer who caters for manufacturers, architects, house agents, *et hoc genus omne*, requires a much more extensive assortment of lenses than is needed in any other branch of the profession, and it is desirable therefore that such money as can be appropriated to this purpose should be expended, so as to secure the most serviceable set of tools. The exact composition of the outfit will, naturally, depend upon the means of the purchaser, but there are certain rules, or perhaps what might better be called facts, which hold good in every class.

The first and most important from the point of view of cost is that for lenses of considerable focal length, there is no necessity for large apertures. With any focal length over ten inches it is rarely possible to work with a larger aperture than *f*/8, *f*/11 or *f*/16 being usually the largest that will give satisfactory depth; the extra cost of an instrument working at, say, *f*/6 is therefore absolute waste, as many have found to their sorrow. Another fact is that with such long focus lenses it is not essential that they be rectilinear, for when only a narrow angle is being subtended there is no perceptible curvature of straight lines in the image made by a single lens. These two points indicate that what are commonly known as "convertible" lenses are particularly suitable for commercial work, the complete lenses having maximum apertures from *f*/5.6 to *f*/8, according to size and series, while the singles give sharp definition at their full apertures of *f*/11 to *f*/12.5. The maximum apertures are only obtainable when the single components are of equal focal length, but as the difference is not great it is wiser to select a lens in which the components are different, that is to say, in the case of an 8½-inch combination the singles should be 17 and 12½ inches respectively, instead of two of 14½ inches. An additional advantage of this type is that other single elements may be added as desired, one of 17 inches giving a combined focal length of 10 inches, or a 21-inch giving an 11-inch combination. The single combinations of many other anastigmats may be used alone, but as a rule require stopping down to an actual aperture of *f*/16 before critical definition is obtained. Cooke and Aldis lenses cannot be used in this way, but both these makes are arranged to take interchangeable front lenses which will increase the focal length by 50 or 100 per cent.

The actual size of the lenses must, of course, be determined by the size of plate most commonly used, the great essential in nearly all commercial work being good perspective, which means a comparatively distant standpoint. Therefore a lens which gives a satisfactory rendering of a piece of china upon a half plate will not do so upon a 12 by 10, as in the latter case the distance would have to be reduced by one half, and the perspective will be too violent. It is difficult to lay down any definite rule, but it is safe to assume that for photographing small articles the lens should have a focal length at least equal to twice the longest side of the plate to be used.

The telephoto lens has not yet received the attention of commercial photographers to the extent that its merits warrant, and we commend its use to those who do not shrink from the little trouble involved in mastering its working. For a comparatively small sum any good quality anastigmat or rectilinear lens can be fitted with

an attachment which will increase its focal length by three, four or more times, so that an image of any required dimensions can be produced from the most favourable standpoint.

Those who cannot afford an assortment of modern lenses will find that for this class of work the older types of rectilinear and symmetrical lenses are little inferior. If of good quality these will cover their normal plate perfectly at *f*/16, while for subjects occupying only the centre of the field larger apertures may be used, but as commercial work usually calls for considerable depth of definition the smaller aperture is usually necessary. The portrait photographer who is in possession of long focus portrait lenses will find these very serviceable for "still life." The larger sizes of the ordinary single lenses, as issued by Dallmeyer and Taylor & Hobson, may also be pressed into service with good effect, and are much to be preferred to even the best anastigmats of short focal length.

A very useful adjunct to the lens outfit is a prism or mirror which can be affixed to the lens for the purpose of photographing objects situated either below the camera or high above it. When working away from the studio it is difficult to improvise a vertical studio stand, especially with a large camera, but with the prism or mirror it is easy to photograph ceilings and monumental brasses, or to make "shadowless" photographs of small objects. Such negatives are, of course, reversed and are best taken upon films or printed upon transferrotype paper which corrects the reversal.

AMERICAN PORTRAITS AT THE PHOTOGRAPHIC FAIR.

By the enterprise of Mr. Arthur C. Brookes, British professional photographers have the privilege of comparing their work with that produced across the Atlantic. The Exhibition of American Pictorial Portraiture, which will be opened next week as one of the attractions of the Photographic Fair, should be intensely interesting, because it may be taken as a true and fair sample of rank and file work.

But although the names that we know are not on the prints, the average of the work is a high one. That it is all pictorial portraiture, as it purports to be, is by no means the case; the majority of the prints are ordinary portraits on behalf of which the only claim to a pictorial treatment rests upon spot-lighting, back-lighting, granular textures and so forth.

The most pictorial example of all occurs in the consignment from the Crowley Stokes Studio, Cleveland, Ohio. This is a landscape—a fine park-like scene, though rather fuzzy, and containing in the foreground small figures of a lady and a baby, the latter on its back on the grass. But it requires some stretch of the imagination to regard these little figures as portraits. Anybody who knew the baby well might risk a recognition, but the presumable mother would defy identification. Garden and park portraiture has been referred to in this journal as a possible field for a new development often enough, and this is the first attempt we have seen in that direction. It suffers from being too parky.

There are also some examples of semi-nude, half-length nude and other interesting things, which can only be described as figure-studies. In this country, at least, ladies do not sit for "portraits" in the nude, or in acrobatic postures with a winding sheet, such as Nickolas Muray, of New York, sends. His distinguished work has already graced the walls of the London Salon, together with that of Rabinovitch, New York, whose portrait of Tagore will be remembered, and that of a young girl, whose characterful face peers out of a black environment in which the dress and the background are indistinguishable.

Other likenesses of well known celebrities are to be seen in the show, the best being, perhaps, the very artistic portrait by R. J. Dooner, Philadelphia, of Pennell, the famous pen-draughtsman. In this there is the complex lighting which American photography has made its own specialty, but which in this case is used, not abused, and is explained by a clever treatment of the background that suggests a source of light for the bright accents. This print is remarkable for airiness and space, while giving full value to the character of the sitter. Mr. Dooner also sends a portrait of the American painter, W. McClure Hamilton, standing at his easel, but the spatial qualities of the Pennell portrait are here quite lacking. A large head, of fine style, in a Bartolozzi red on a grained paper like a Michalet, will be, or should be, much admired. A portrait of Tolstoi and other celebrities are amongst an excellent set sent by Miss Clara E. Sipprell, New York. They are all straightforward, artistic work.

Another excellent group is by Miss May L. Smith, of Binghampton, N.Y., composed of portraits of ladies and children. One particularly delightful baby wears an expression of preoccupation or abstractedness which is very winning, and the interlocking of its pudgy little fingers is most fortunately given.

It is evident that the American parent is enthusiastic in the practice of child-portraiture, to judge by this selection which reaches us from all parts of the great continent; and as a rule the successes are to be found in this genus. Miss Sophie L. Lauffer, of Brooklyn, shows one or two very vigorous presentments of aged persons not remarkable for beauty, but she redeems the attractiveness of her exhibit by a large head of a child in a light key. Two children, in mob caps, are likewise the best things in Miss Peggy Stewart's selection from Canandagua, N.Y. They are brightly yet firmly handled, and have abundant infantile charm. Her other works are less simple in motive: a man, for example, whose face is given with a tightness of focus that is unusual, whilst his shoulder is positively dematerialised by diffusion. Another man is photographed with beads of perspiration on his brow.

Other attractive children will be found in the collections by E. Willard Spurr, Waterloo, especially the girl in a kind of basket hat, with her pretty pose; and by Mrs. Emma Hilton, New York, particularly the delightful group of a boy and girl playing with a telephone receiver. In some of this lady's work there is a curious impinging of dark tones upon the light parts of the print. Whether this is by accident or intention it is difficult to say, but it imparts a sort of transparent, alabaster look to her forms that can hardly be thought desirable.

Of more purely pictorial work there are some good examples by J. E. Mock of Rochester. They are versions of a model who holds a dish of fruit À la Titian's Daughter. In most cases the poses are too violent and strenuous; but one is really fine in style and in its quiet grace does remind one of the famous Titian. The Gerhard Sisters, of St. Louis, have also the grand style in mind. Their designs are good, and one, a girl leaning over in contemplation of a vase, has beautiful lines. All these are executed in a granular method, which is often aggressive unless one puts the print far enough off from the eye. W. A. Vinock of New York also affects a strong grain. This and many another innovation, is probably an excusable attempt to get something that has not been done

before. All such motives may have a commercial justification, but it is difficult to see how such onterprise will exalt the standard of portraiture by photography, whether we claim, or not, that it is pictorial.

For the popular taste perhaps the bright, sparkling and rich style adopted by F. A. Free, of Davenport, is most likely to meet with all-round commercial success. He gets remarkable animation and nttractiveness of personality.

If an exhibition is able to inspire in any way our own workers it must be in the direction of artistic insight and feeling, and for any such suggestions in the Horticultural Hall the thanks of the profession will be due to Mr. Arthur Brookes for having invited the American professionals to submit their work to our judgment, and to Mr. Mackie who, we understand, is the "producer" of the show, as the stage term goes.

F. C. TILNEY.

THE PHOTOGRAPHIC FAIR.

THE Fair, which opens at the Horticultural Hall, Vincent Square, Westminster, on Monday next, will be found to represent as great a gathering of photographic manufacturers and dealers as at any of the previous Fairs. Moreover, there is this year a feeling of strength, arising on the one hand from a more settled state of the national affairs and on the other from the announcements of reductions in the prices of apparatus which figure prominently in the propaganda of camera makers. Last year, it will be remembered, that the Fair opened on the "Black Friday," from the labour point of view, under the threat of a general railway strike throughout the country in support of the Miners' Federation. Fortunately on that occasion wiser counsels prevailed, and the Fair, during the following week, enjoyed what we believe as a record attendance by the public. While that interest was satisfactory, so far as it went, the fact could not be disguised that the high level of prices was a hindrance to the expansion of photography in correspondence with makers' resources in this country. This year as great an interest on the part of the public may be counted upon, in fact greater, since those interested in the pastime of photography can get their equipment at substantially lower prices, and may reasonably look forward to further reductions not only in the initial cost of apparatus, but in the running expenses represented by sensitive materials, chemicals, and the minor accessories. Thus, as we point out in a paragraph on an earlier page, there is the justification for taking a more cheerful view of the near future of photographic business than we find commonly expressed in various quarters. There seems little doubt that the present season will be a thoroughly good one in the sales of apparatus and materials for amateur work; and revival in portrait and commercial photography will follow close upon the heels of a similar improvement in the general trade of the country; and of the latter, returns of various kinds which have appeared in the daily Press provide considerable evidence.

Inasmuch as our issue of next week could not be published until the day before the closing of the Fair, we have followed our usual custom of obtaining from the exhibitors advance particulars of the goods, and particularly the new introductions, which they will show. As will be seen from the notes which follow in an order corresponding with the numbers of the stands, there is a goodly array of these new introductions, the most notable of which may be signalised as follows:—

- A new brand of roll film.
- Two collodion self-toning papers.
- Warm tone development papers.
- Grades of Platinotype.
- Numerous new models of folding film and plate cameras.
- A new folding reflex.
- *f*/2.9 lenses.
- Cine taking and projection lenses.
- Electric drive and distance control of cinematograph camera.
- New type of exposure meter.
- Dark-room lamps.
- Developing tanks for plate and film.
- Printing and drying machines.
- Apron printing machines.
- Vertical self-focussing enlargers.
- Dry-mounting iron.
- Passe-partout requisites.
- Studio spotlight.
- New styles in enlargements in water colours.
- Art leather articles.
- Handbooks on photography.

Although the Professional Photographers' Association haa this year chosen a later date and a different meeting place for the holding of its annual Congress, there is no doubt that the Fair will be largely attended by professional and commercial photographers in the Metropolitan area and from the Provinces. That such will be the case is fairly indicated by the fact that firms whose interests are exclusively with the portrait and commercial photographers are exhibiting as usual, while the general manufacturers and suppliers are giving their normal degree of prominence to professional apparatus and materials in their displays. As already announced professional photographers may obtain a ticket for admission to the Fair during the whole course of the week on application to the Organising Secretary, Sicilian House, Southampton Row, London, W.C.1, at the cost of 1s.

A special attraction is provided for the professional portraitist in the shape of a large collection of examples of portraiture by leading studios in the United States. A review of these portraits by Mr. F. C. Tilney will be found on another page.

The Congress of the Photographic Dealers' Association will be held during the Fair week in accordance with a programme, particulars of which will be found elsewhere in this issue.

Stands Nos. 1 and 2—Kodak, Ltd.

IN the professional section of the Kodak Co.'s exhibit will be shown, among many other items, prints on the Kodura, Kodura Etching Brown and Kodak bromide papers. The Eastman projection printer, with its miraculously ingenious feature of self-focussing, will attract attention, and so also will the diffusing discs which are now obtainable for attachment to any photographic lens, converting the latter into a soft-focus objective. The moderate degree of softening in the definition which is produced by this attachment should find wide favour. A new accessory is the Kodak focussing spotlight, a little electric lamp for the studio fitted with a lens and diffusing screens and serving as an auxiliary source of light capable of infinite adjustment, for the purpose of introducing light accents into a portrait, relieving flatness of lighting, and, if the photographer has a liking for theatrical effects in portraiture, providing the means of getting the showy and striking effects which are fashionable in some quarters.

The dealers' section of the Kodak show will be fitted up as a shop front, the windows of which will be changed every day. One window will show how to make an effective display in a large space, while in the other smaller window the visitor will be able to learn how to produce an equally effective style of window dressing, even though he has little space at his disposal. There will also be a display of Graflex cameras, fitted with telephoto lenses, as well as many new aids to picture making for the amateur. Those engaged in developing and printing of amateurs' films should not omit to note an electric heater for the tank solutions, by means of

which the latter are very conveniently and quickly brought to a proper working temperature simply by immersion of the heater in them for a minute or two.

The Wratten Division of the Kodak Co. will include Wratten light-filters, with transparencies showing the actual light transmitted by them; also reproduction of engravings and coloured originals in monochrome and colours on film. In addition to Wratten dark-room lamps and safelights, aerial mapping cameras will be shown, and examples of commercial photography on film.

Stand No. 3—White Band Manufacturing Co., Ltd.

New introductions at this stand are a one-solution concentrated developer for all makes of British gaslight and bromide papers and plates; ready-for-use gaslight and tank developers, green, blue and sepia toners; a glazing solution (Glosso) for prints and an intensifier of the re-developer kind. The firm is also showing the Loopa daylight developing tank for beginners' use and of extremely simple construction. The Monomet developer and the various compressed tablet and packet developers, in addition to the mountants, fixing salts, and other chemical preparations, will form part of the exhibit.

Stand No. 4—Johnson, Matthey and Co.

Inasmuch as the salts of silver, gold and platinum, so essential to photographic processes, reach us now-a-days in the manufactures of the sensitive material firms, an exhibit such as that of Messrs. Johnson, Matthey is of special interest in showing the refined skill which is applied to the manufacture of these so-called "raw materials" of the photographic industry. One cannot look at the glittering specimens of silver nitrate, gold chloride, and potassium chloroplatinite without being convinced that at this initial stage nothing has been left undone in giving to these products the highest degree of purity. Messrs. Johnson, Matthey's name stands for this hall-mark of quality, and their exhibit serves as a useful reminder of the debt which users of photographic materials owe to the skill and science of the refiners of precious metals.

Stand No. 5—Sanger-Shepherd and Co.

The student of sensitometric methods in the testing of plates and printing papers has special reason to spend a time at Messrs. Sanger-Shepherd's stand, where are shown instruments—some of them quite simple and inexpensive—for the measurement of density, exposure of plates, etc. These include the even and step wedges by the use of which many sensitometric experiments are greatly simplified.

In orthochromatic photography the exhibit includes numerous accessories, such as the firm's well-known graduated light-filters and filters, cameras, and other appliances for processes of colour photography.

Stand No. 6—R. and J. Beck, Ltd.

Messrs. Beck's exhibit will consist of a complete series of the photographic lenses manufactured by them in various forms of mountings and shutters together with examples of work done by the lenses. The latter include the Isostigmar, Neostigmar, and Bystigmar series.

Stand No. 7—The Platinotype Co.

Some recently introduced new grades of Platinotype, Palladiotype and Satista papers will be shown for the first time, and demonstrations given at frequent intervals of the great simplicity of the manipulation of these papers. The Platinotype Company are fortunate in being able to put before the eyes of the visitor, within a few seconds, the making of a print in one or other of these media, and the specimens which they are accustomed to show must always awake envious thoughts in the minds of those who set store by superlatively beautiful technical quality in prints.

Stand No. 8—The Autotype Co.

The growing favour of the Carbro process among both professional and amateur photographers is reflected in the announcement that the Autotype Company will devote a chief part of the services of their staff at the Fair to demonstrations of this method of making carbon prints. They will also exhibit their latest styles in carbon and bromide enlargements, finished in monochrome, water colours, etc., also ivory and ivorine miniatures and vitrified copper enamels. As on previous occasions a special feature will be prints from portrait negatives illustrating the great range of colours (of the image and its support) offered by the double transfer carbon process.

Stands Nos. 9, 22, 23, 24—Amalgamated Photographic Manufacturers, Ltd.

Corresponding with the formation last year of this combination of the interests of Messrs. Marion, Paget, Rajar, and other firms, the manufactures of the Company are grouped under the single title, although the goods will be found displayed at different stands.

Perhaps the most notable of the exhibits will be the new models of roll-film and reflex camera manufactured by the Kershaw branch of the Company, and just issued under the trade mark of "Apem." The film cameras are of both box and folding pattern, and the reflex, in quarter-plate size, represents the success with which the manufacturers of the long-renowned Soho reflex have applied their resources to the supply of a reflex instrument at a most popular price. Another new introduction, marking the larger entry of Messrs. Kershaw into the manufacture of photographic requisites, is the developing tank which we reviewed a few weeks ago. At the Fair a daylight developing tank for roll-film will also be shown, and also a circular print trimmer.

Professional photographers will have the opportunity of seeing the unique Norka studio camera and the electric studio lighting outfits in which the Marion branch of the A.P.M. has so long specialised.

In photographic materials the exhibits will show the results obtainable on Rajar, Marion and Paget plates and papers, and of course also the latest specimens of the Paget process of colour photography.

Stand No. 10—Adams and Co.

A Fair would be incomplete without some new design of hand camera from makers of such experience and originality as Messrs. Adams. This year it takes the form of a new folding reflex—the Aidex made in quarter-plate size only, instantly opened and erected for use, yet exceedingly small and compact when folded. These facilities at the same time permit of any lens from 6 to 9 inches focal length being fitted, as also various focal lengths of telephoto. The Aidex is supplied with the well-known Minex self-capping focal-plane shutter.

The folding Minex itself will be shown in the 1922 model embodying a number of improvements, whilst retaining the triple extension, revolving back, large rising front and other features of this notable instrument. In the box form Minex A a long viewing hood is provided together with rotating back and automatic adjustment of mirror and shutter. These Minex instruments will also be shown in tropical patterns of brass-bound teak.

Other items in Messrs. Adams' exhibit will be the studio Minex camera and the series of folding Vesta cameras, an addition to which this year is a shutter giving speeds up to 1-300th of a second.

Stand No. 11—Taylor, Taylor and Hobson, Ltd.

Among the new optical introductions of the year are a series of ultra-rapid *f* 3.1 cinematograph-taking lenses designed by Messrs. Taylor, Taylor & Hobson, which will be shown at this stand. The firm has also introduced a new cinema projection lens, giving a greatly increased luminosity on the screen. The well known series of Cooke lenses, of apertures ranging from *f*/3.5 to *f* 6.5, will, of course, form a prominent part of the exhibit, and there is also the recently introduced Cooke fixed-focus telephoto lens. Photographs and enlargements serve to demonstrate the high optical excellence of these instruments.

Stand No. 12—Leto Photo Materials Co., Ltd.

The excellent results which are obtained by modifications in the treatment of the renowned Seltona (collodion) paper and Boardoids are to be shown in profusion at this stand, where the visitor may see the definite and agreeable tones obtained according as the paper is fixed with or without the use of a salt bath, and also the striking effects most readily obtained by partial use of a salt bath and of platinum toning. The Leto Company have a number of specialties in the way of plate markers, frame border negatives, shaders, etc., which will be shown.

Stand No. 13—O. Sichel and Samuelson.

This stand will be devoted specially to the exhibition and demonstration of machinery for the development and printing of amateurs' film negatives. Messrs. Sichel will show the Hodgson printing machine and the Hodgson drier, both of which have been reviewed in our pages, and also a cheaper printing machine and a series of new iron tanks measuring 42 by 12 by 8 inches for the handling of film negatives. It is hoped also to show a new pattern of vertical enlarger shortly to be placed upon the market at a moderate price. Messrs. Sichel are also specialists in the supply of oval and square frames, and these goods will form a part of their exhibit.

Stand No. 14—Ross, Ltd.

The professional and the amateur will have every opportunity of choosing a lens for their requirements from the many series of high-class instruments of which Messrs. Ross are the designers and manufacturers. These include the *f*/4.5 Xpres lenses, for studio and outdoor work and for hand cameras, and the Ross cabinet and other lenses of the portrait type. Among lenses of somewhat lesser aperture are the Homocentric and the Combinable, the latter affording three focal lengths by the purchase of a single instrument. Then for Press and other cameras the extension of which is limited there are the *f*/5.4 and *f*/6.8 Telecentric lenses affording a focal length very nearly double that of the permissible camera extension and peculiarly suitable for the photography of such different subjects as sports and Nature studies. Messrs. Ross will also show their established patterns of hand and stand cameras and their most recent work, the cinematograph projector outfit, as used in many super-cinemas.

Stand No. 15—Kosmos Photographics, Ltd.

A new Kosmos paper, self-toning collodion, will be introduced for the first time at the Fair, and examples of its use shown. The exhibit will likewise draw special attention to the results on the Company's newly-introduced Novex plates, as shown by prints and enlargements on Vitegas and Kosmos bromide and on Novex gaslight papers. Workers of the Bromoil process will be provided with a demonstration of the special suitability of Vitegas paper in the shape of Bromoils made from prints obtained on it. The contents of the Kosmos stand will also include a collection of portraiture by British and Continental artists.

Stands Nos. 16 and 17—Houghtons, Ltd.

Some three hundred different models of British-made Ensign cameras will be shown by this leading firm of manufacturers. Among them are a considerable number of new models, notable among which are the Ensign Klitos, single extension hand cameras for plates or film-packs in the 3½ by 2½ inch size and also the 8 by 12 cm. size, the latter, the No. 4 standard size, yielding pictures measuring 4¼ by 2⅞ inches. The prices of these cameras range from £3 17s. 6d. A de luxe model will also be introduced fitted with a high-class *f*/4.5 anastigmat and Ilex Acme shutter. Among reflexes Messrs. Houghtons will show at the Fair the Tropical-Popular model of their Ensign reflex. Other new models of folding hand camera are the flush back popular Ensigns and others of similar design fitted with *f*/4.5 lenses; and a popular model of the Ensignette. Some new patterns of folding metal tripods, dark room lamps and printing boxes, printing frames and albums will likewise be included in this comprehensive exhibit. In particular reference may be made to Mr. K. C. D. Hickman's water circulator, an appliance for the conversion of any dish or vessel into a washer for negatives or prints.

Equipment for developing and printing of amateurs' films will be shown in the shape of printers, driers and tanks for this branch of work, together with advertisement showcards, etc., for the use of dealers.

In a room on the first floor next to the exhibition of American portaiture Messrs. Houghtons are bringing together an exhibition of their apparatus and other requisites for professional portrait photography, including studio cameras and stands, studio accessories, equipment for the dark room and printing room, mounts and albums, among all of which there will be an exhibit of English professional portraiture.

Stand No. 18—Thornton-Pickard Co., Ltd.

The widely-known specialities of this firm, many of which have been issued in improved models for the coming season, include such old standbys as the T.P. roller-blind shutter, the College, Imperial and Royal Ruby field outfits, and a great variety of hand cameras. Among these is an improved Imperial pocket camera, the Klippa collapsible camera, an all-weather press camera, and various models of the Thornton-Pickard reflex. Enlargers and other accessories will be included.

Stand No. 19—Newman and Guardia, Ltd.

At Messrs. Newman & Guardia's stand we are promised a new model of the Sybil folding pocket camera, an addition to the many models of this most excellent instrument for roll film or plates. A new folding enlarger, for use either with daylight or by artificial light, will be shown. The exhibit will, of course, include the folding reflex camera which was the notable introduction at last year's Fair, and also ultra-portable tripods and other accessories for hand camera photography.

Stand No. 20—W. Butcher and Sons, Ltd.

Messrs. Butcher have many hand cameras to show, and commendably are emphasising the reductions in price which apply to them. For example, a new model of the watch-pocket Carbine is obtainable at £2 10s., and the Popular Carbine, for roll-film or plates, from £3 12s. 6d. in 3½ by 2½ and 2⅞ by 4⅞ sizes. Another plate camera, to which they are directing special attention, is the popular Cameo of 8 by 12 cm. size, priced at £3 7s. 6d. upwards. At the new prices a metal dark slide is included with each camera taking plates or films.

Their watch-pocket Carbine may be obtained in a roll-film model for 3¼ by 2¼ pictures, fitted with *f*/4.5 lens.

Amateur enlargers will be interested in the Primus half-watt light, suitable for different voltages. The light is given by a globe filament provided with a special mirror.

Messrs. Butcher are also showing a series of new models of electric dark room lamp, one of which is supplied complete with battery for use in houses where there is no electric current.

Dealers should not omit to inspect the sundries cabinet, for the display and handling of stock, which is made in polished oak with a glass top, and is sent out on loan free of charge.

Stand No. 21—Acme Art Association.

This old-established firm of colourists and artistic craftsmanship for professional photographers will show a selection of its recent work in miniature painting on ivory and ivorine, with and without basis, water colours, oils, pastels and pencil sketches. Recently it has taken up certain specialties in more popular demand such as statuettes and jig-saw puzzles, examples of which will be shown. And its very latest excursion into a new field of artistic work is in the fabrication of

leather hand bags, book covers, and even such articles as bedroom slippers. We have recently seen some of the first examples of these goods which are certainly of most artistic design and workmanship, and may very properly be offered for sale in many photographic businesses. We expect that the many women photographers will at once fall in love with them and will have no hesitation in adding them as a profitable side line to their portrait businesses. If any excuse were necessary—we do not think it is—it may be found in the fact that the goods differ distinctly from those which are on sale at the large stores or in the shops which handle articles of this kind: at the same time, they are made in a variety of styles. Moreover, the hand bags and book covers lend themselves to the inclusion of a miniature photograph and thus form most acceptable photographic gifts, as may be seen from the specimens at the Fair.

Stand No. 25—Criterion, Ltd.

At an attractive stand, representing an ancient half-timbered building, the Criterion Co. are bringing together a full display of results on the many descriptions of sensitive materials made by them. Prints on the Criterion Non-stress series of bromide and gaslight papers figure prominently in this display, as also do those on the firm's P.O.P. and Estona (self-toning) papers. Criterion plates and Criterion roll-film come in for equal emphasis. The film is now manufactured in 22 sizes, designated by letters from A to V, so that a given size is readily supplied for fitting to any camera.

As manufacturers of the Kerotype transfer bromide and gaslight papers, the Company is showing the many and varied artistic effects which are obtainable by the transfer of the prints to surfaces such as silk, satin, canvas, linen, wood, ivory, metal, etc. Professional photographers in particular will be interested in these prints representing effects which are very readily obtained with the new commercial material. For the professional who undertakes cinematograph work there is the Criterion cinematograph film both negative and positive.

Stand No. 26—James A. Sinclair & Co., Ltd.

The Fair is fortunate in including for exhibition a most important advance in cinematography in the shape of the electric drive of a cinematograph camera, which has been worked out by Messrs. Sinclair and applied to their surpassingly designed and made N.S. cine camera. The drive is provided by a small dynamo, taking its current from an equally small battery, the two together occupying only a few cubic inches of space, and weighing only 3½ lbs. The dynamo is mounted on a panel, which is instantly attached to the metal casing of the camera, the operation providing a gear wheel of the interior mechanism with a positive drive. The battery may be held on the top of the camera or carried by the operator. Although Messrs. Sinclair claim for their device that one battery will drive only 400 ft. of film through the camera, they are able to quote the experience of Captain Noel, in command of the photographic section of the Mount Everest expedition, that a battery suffices to drive nearly 2,000 ft. of film. It must be remembered, however, that the N.S. camera has an extraordinarily light-running mechanism, and it can hardly be assumed that the battery-actuated dynamo would drive even the claimed length of film in other cameras. The facility of a self-contained mechanical drive for the cinematograph camera is one of the greatest importance in topical work, since it makes the cine press-photographer as mobile as his colleague with an ordinary camera. How often is it noticed in topical films of current events that the cinematograph operator, owing to the fixed position of his camera on a tripod, has his view blocked at the critical moment. Messrs. Sinclair, moreover, have provided their electric drive with a further feature, which extends its scope, namely, that of starting and stopping the drive by electrical control at any distance. Their device for this purpose also includes a relay, which shows that the mechanism of the distant camera is working. This distance control is at present being used with very great advantage on the Mount Everest expedition for obtaining cinematograph records of Thibetan and other natives. On account of the objection, common to many of the races in the Far East, to allow themselves to be photographed, any camera which required the operator to be near at hand would be useless in many circumstances.

Messrs. Sinclair are, of course, showing their well-known photographic specialties, such as "Una" cameras, lens hoods, Bromoil requisites, etc. Among them is a neat frame finder and view meter which the user can set in exact correspondence with the focal length of his own lens and can fix conveniently on almost any type of folding or box camera. When not in use this little accessory folds flat within an incredibly small space.

Stand No. 27—Reginald E. Carter, Ltd.

Mounts and frames for the professional photographer form the staple of this exhibit. As agents for Messrs. Bartons', of Birmingham, Messrs. Carter offer an exceedingly fine display of mounts and mounting papers, folders and albums, and the very artistic and strong metal binding for framing in the passe-partout style. The opportunity for seeing the difficultly-describable tints and textures of mounts is one which forms a particular inducement for professional photographers to visit the Fair and to study at their leisure a collection such as that of Messrs. Carter's.

Frames in wood, metal, and leather, and also cases and rims for miniatures, are other specialties of this firm, which are offered in many exclusive and beautiful styles.

Stand No. 28—J. H. Dallmeyer, Ltd.

A new anastigmat, working at the great aperture of *f*/2.9 and issued in focal lengths from 1½ inches to 12 inches, is the outstanding novelty at this stand. Although the depth of focus of the medium and greater focal lengths is necessarily small, lenses of such enormous aperture open up possibilities for exposures under conditions which have hitherto been impossible. In the focal lengths from 8 inches to 12 inches the lenses are obtainable in a special type of mount allowing of diffusion in portraiture.

Fixed focus telephoto lenses (the Dallons) of aperture *f*/5.6 to *f*/7.7 are made in focal lengths from 5.3 to 17 inches corresponding with camera extensions from 3 to 8½ inches. These lenses are of extremely simple construction and can be fitted to many folding hand cameras, thus providing the facilities which otherwise would call for a camera of double extension.

Among lenses of the ordinary type, a new anastigmat is the Series V. Perfac, in which only four glasses are used and which is suitable for fitting to hand cameras. Messrs. Dallmeyer are showing others of their lenses including the universally known Patent Portrait Series and also a naturalist's reflex hand camera fitted with a Grandac telephoto lens giving 25 inches focal length at a camera extension of 6 inches and working at an aperture of *f*/10. A large, new catalogue announcing considerable reduction in price of a number of the lenses will be published on the opening day of the Fair and will be obtainable there.

Stand No. 29—John J. Griffin and Sons.

Messrs. Griffins, as suppliers and manufacturers of requisites for both the professional and amateur photographer, will exhibit on their stand a large variety of goods representing these two departments of their business. In the professional section they will show new flash lamps, the Howellite gas outfit for studio portraiture, and many pieces of apparatus and accessories for the studio, such as reflectors, vignetters, cameras and lenses, shutters and backgrounds. Among other items of workroom equipment they will exhibit card bevellers and cutters, printing-boxes, die-embossing presses, plate-marking platens, re-touching desks and their latest styles in mounts and folders.

For the amateur special prominence is given to results on

the Noctona (gaslight) and Goldona (self-toning) printing papers, on the firm's Bromoil papers and specimens of the use of the many Griffin chemical preparations in the shape of developers, fixing salts and toning compounds; also developing tanks for plates and roll film and a full range of folding plate and film and reflex cameras.

Stand No. 30—Elliott and Sons, Ltd.

Messrs. Elliott invariably provide an object lesson in artistic display of prints, and this year will apply their taste in this direction to the showing of leading professional, technical and portrait work on Barnet plates and papers. Their 550 H. & D. Super-Speed plate is obtainable also as a matt emulsion, facilitating hand work on the film with pencil, crayon, etc., to a remarkable degree. Examples will be shown. Their bromide papers include Verona for warm black prints by direct development, with others of cream and white colour in a wide range of distinctive textures, a feature of their business in which they have long successfully specialised. The Bar-Gas (gaslight) paper is made specially for the requirements of D. & P. trade, and their Bartona (self-toning) is a paper providing a wide range of tones simply by modification in the strength of the hypo-fixing bath.

Messrs. Elliott will also show Bromoil prints made on their bromide papers, and will have on sale a new and revised edition of the "Barnet Book of Photography," the regular publication of which has, unfortunately, been suspended for some years. Professional photographers are particularly invited to inspect portfolios of the firm's enlarging work finished in monochrome and colours.

Stand No. 31—Johnson and Sons.

As in previous years Messrs. Johnsons will show an exhibit composed of the bulk chemicals and chemical preparations (compressed tablets, packets and cartons) for the photographic processes. Naturally the amidol, metol, glycin and hydroquinone of their manufacture obtain a very prominent place in this display, as do also the single-solution developer Azol and the tablet developer Vedol, in the use of both of which they have helped the photographer by working out tables for development by time and temperature. Chemicals, such as iron perchloride and collodions, for process work, will also be shown, and the visitor will have an opportunity of seeing the results obtained by preparations for blue, green, red and sepia toning of prints.

Stands Nos. 32 and 33—Gevaert, Ltd.

The special feature of the comprehensive exhibit at this stand is the collection of prints on the new Vittex paper, of the chlorobrom variety for exceedingly pleasing brown-black tones by ordinary metol-hydroquinone development. The professional photographer in particular will be interested in these renowned results and indeed equally in those on the other varieties of Gevaert development papers.

Practically the whole of the exhibit is made up of specimens from negatives on the various grades of Gevaert plates, the Sensima ultra-rapid 500 H. & D., the Special Sensitive and the Professional Green Label. The amateur worker will turn to the work done on Gevaert gaslight and self-toning papers to that with the Filter Ortho plate, and to the transparencies on the Gevaert lantern plates.

Stand No. 34—Bean and Halliday.

As in previous years, this Yorkshire firm of mount makers will bring together a representative exhibit of their latest styles in mounts, folders, albums, and wallets. Their specialties include also all descriptions of mount, slip-in, etc., for amateur requirements; also calendars for photographers undertaking commercial work mounts for enlargements, and flexible art mounting boards are among their other manufactures.

Stand No. 35—Adhesive Dry Mounting Co., Ltd.

This pioneer Company's display of equipment and materials for dry-mounting includes presses for both professional and amateur use, and visitors will have the opportunity of witnessing constant demonstrations of the process. The latest type of visible trimming desk will be shown, and the exhibit will be completed by inclusion of a full range of mounts, loose-leaf albums and of border tints for the many effective styles of multiple mounting to which the dry-mounting process is specially applicable. The Company will also show and demonstrate a new small electric iron suitable for amateurs for the dry-mounting of prints from about 3 x 2 ins. to cabinet size.

Stand No. 36—J. Lizars.

Among the many models of the well-known Challenge series of cameras, will be shown the most recent introduction, namely, a $3\frac{1}{4} \times 2\frac{1}{4}$ folding pocket camera for roll film and glass plates, requring no change of the focussing scale when using one or the other of these different sensitive materials. Messrs. Lizars will also show examples of the tropical models of cameras in which they have long specialised.

A new exposure meter will be shown in the shape of the Milner light-gauge, a very small and thin form of meter, in which an entirely novel principle is adopted, the light being gauged by reflection through a disc of tinted film. The exhibit will also include several models of Brunette home cinematograph projectors, taking films of the standard size. The light in one model is generated by manual operation of the handle which moves the film, others are provided with a small motor for the machine drive, taking their current for the lamp from the ordinary house supply.

Stand No. 37—Robinson and Co.

In this exclusively profesional exhibit—Messrs. Robinson undertake their work in enlarging and water colouring only for professional photographers—there will be examples of several new styles in coloured enlarged portraits. One of the choicest of these is that named the Ideal—a beautiful style of water colouring, with an appropriate line ruling around the portrait. Messrs. Robinson make a specialty of masked enlarging work on a single sheet of paper, and obtain some very striking and pleasing effects by the work of their colourists on the margins or backgrounds.

Another new series is the Barribal, both solid and vignetted in the style of this artist. Broad slashes of colour are used to produce a very decorative effect in either a light or a dark key, the style lending itself to portraits of both men and women and children. For men, Messrs. Robinson have another new style, the Vandyke, in which a brown background is worked in by themselves. Another new introduction is the Duchesse panel, a vignette with a cleverly-added background in wash. For portraits of children there are some examples of the firm's exceedingly clever work produced in a sketch style of 20 x 16 size, in which an appropriate background is added to the portrait.

Messrs. Robinson are also making a special study of masonic portraits in water colours, and show the very excellent effects they obtain in the rendering of regalia. Another specimen, containing the red robe of a mayor, shows also the effective use which they make of water colours.

A notable feature at the stand is a 40 x 30 water-colour portrait of a lady draped in ropes of pearls. For the effect five colours were used for each pearl, a sufficiently eloquent tribute to the craftsmanship and patience of the firm's staff. This and the other exhibits, some of which we have mentioned, should not be passed by without noticing the distinctive frames which Messrs. Robinson adopt for their work, and to which they are constantly adding new patterns.

Stand No. 38—Thomas Illingworth and Co., Ltd.

Two new Illingworth manufactures will be launched at the Fair. One is Illingworth roll film, negatives made on which will form a prominent part of the display. The other is a collodion self-toning paper, a variety of printing material which has not hitherto been made at the Willesden factory, but which has now arrived to take its place with the other

favourite papers, Slogas (gaslight), and Enitone (gelatine self-toning). Messrs. Illingworth have thus the satisfaction of emphasising to dealers that their manufactures now include the whole range of materials for the amateur worker, film, plates, and all varieties of printing paper.

At their large stand, so conveniently adjacent to the refreshment department, Messrs. Illingworth will also show a collection of big toned enlargements made on their Bromide De Luxe. Some of these are from negatives taken by Mr. T. Midgley Illingworth on his recent tour round the world: others are portraits by Mr. Herbert Vandyk, of Princess Mary and Viscount Lascelles and other members of the Royal Family, whilst the recent royal wedding is represented by an enlargement of a photograph of the ceremony in Westminster Abbey, from a negative taken by the photographic department of "The Times," on the Illingworth Super Fleet plate.

The merits of Illingworth panchromatic and studio plates, lantern plates, and other grades of dry plate, will also form part of the exhibit.

Stand No. 39—Wellington and Ward.

The introduction of a new Wellington printing paper is assuredly in itself an event of photographic importance. Messrs. Wellington and Ward will make the Fair the occasion to bring before the public a new development paper which they are calling Q-Tone. It is a paper yielding a rich warm black image, together with an exceedingly long scale of gradation by direct development. Professional photographers in particular will be anxious to make themselves acquainted with this new product from a factory which has provided them with so many plates and papers of the highest excellence in use wherever photography is practised.

A new edition, the twelfth, of the Wellington photographic handbook will also make its appearance at the Fair, with added chapters on cameras and the Bromoil process, and including instructions for the new Q-Tone paper which we have just mentioned.

As regards other items of the exhibit, it is hardly necessary to say that those delighting in prints, negatives, and transparencies of the highest technical quality will be able to see them in the shape of the specimens on the many Wellington printing papers, plates, and lantern plates.

Stand No. 40—Witt and Westley.

Mounts and mounting materials for the professional photographer are the customary exhibit of this firm, and will again be shown in the latest styles, demonstrating Messrs. Witt & Westley's long experience in the highest branches of this manufacture. Frames of inlaid wood and leather are also among the firm's specialties, and the exhibit will also include dry-mounting machines, the Weslem dry-mounting tissue, and Ivorex retouching varnish.

Stand No. 41—Raines and Co., Ltd.

Messrs. Raines are bringing together a powerful exhibit of their resources as high-class enlargers, artists and colourists for photographers. A striking item is a 54-in. sepia carbon enlargement, a full-length portrait of a lady on a staircase. Straight bromide enlargements, in black and sepia, have long been a specialty of the Ealing firm, which has rightly emphasised the great merits of such work if done as well as it can be done. One of these enlargements is a portrait of the late Sir Ross Smith. The firm's work in oil portraits on canvas, with and without photographic basis, will be shown, and also a series of specimens of its styles in water-colour portraits, including a new one 18 x 14 ins. in an oval frame. We are glad to see that Messrs. Raines are directing attention to portraits in pencil-sketch finish, a style particularly effective for studios whose customers can appreciate work of taste. The exhibit will incidentally provide a demonstration of the firm's artistic craftsmanship in mounting and framing, and will also include lantern slides and mounted contact prints in carbon, bromide and gaslight.

Stand No. 42—F. Brodrick, Ltd.

Equipment for the quantity development and printing of amateurs' films forms a chief part of Messrs. Brodrick's exhibit, and includes teak tanks and dishes of all descriptions, printing and washing machines, etc. The professional photographer will also find at this stand many of the dark-room and work-room accessories which are a specialty of the firm. As designers, builders, and fitters of studios, shops and works, Messrs. Brodrick welcome inquiries for contracts of this kind, and will have on view a selection of designs illustrating their experience in this field, and in particular in the artistic furnishing and decoration of premises.

Stand No. 43—Burroughs Wellcome and Co.

The special feature at Messrs. Burroughs, Wellcome's stan is a collection of 88 quarter-plate negatives, each developed with a single fluid oz. of developer made up from the firm's well-known "tabloid" Rytol, a demonstration of the efficiency and economy of this compressed developer, for the use of which tables for development by time and temperature are available and may be obtained at the stand. The exhibit will also contain enlargements from some of Mr. Ponting's South Pole negatives, in the making of which Rytol was exclusively used. The green tone of these enlargements is obtained by the "tabloid" green toner, and the exhibit will show the range of tones in lantern slides obtainable by the use of other "tabloid" developers and toners.

Stand No. 44—Anglo-French Photography Co.

As agents for the old-established firm of Grieshaber et Cie, this company will show a collection of artistic photographs made on the Grieshaber papers, and will show results obtained on the full range of dry plates issued by the French makers. There will be also on view a collection of stereoscopic views of war scenes on the French front, depicting a number of incidents in the actual fighting with more gruesome reality than has commonly been displayed in war photographs. It is claimed for these views that they are almost unique in their truthful representation of the horrors of warfare.

Stand No. 45—Ilford, Ltd.

As in previous years, the Ilford Company will bring together a great variety of exhibits of technical interest. The amateur or professional desirous of studying the different effects obtainable by variations of material or method of treatment will probably find a greater number of specimens repaying his attention at this stand than at any other. The range of tones from red to cold purple obtained by using different strengths of hypo bath with Intona self-toning paper, is one of these exhibits. Another is a somewhat similar collection showing the variation in tone obtained on the Ilford P.O.P. by simple dilution of the toning bath. In the case of the Ilford gaslight papers, the exhibit demonstrates the correct variety of paper to use for the printing of different classes of negatives, and also the range of tones obtainable from black to sepia or red.

The characteristically beautiful results in the shape of transparencies on Alpha lantern plates by simple development, with or without gold toning, should not be omitted by the slide maker, who may also observe the results on the more rapid Ilford Special lantern plates when metol-hydroquinone or pyro is the developer.

Naturally, an Ilford exhibit would not be complete without a demonstration of the Ilford negative plates, and particularly the panchromatic. Examples of the use of the latter in aerial photography will be shown, and also specimens of three-colour and orthochromatic work. Negatives on the ultra fast Zenith 650 H. & D. plate will also be shown, and the Company will include also such specialties of its manufacture as Desensitol, light-filters and safelights, and its new colourless Q filter for absorption of the ultra-violet.

Stand No. 46—E. B. Fry, Ltd.

In addition to everything for passe-partout and lantern-slide work, Messrs. Fry have quite a series of new introductions which will be shown for the first time at the Fair. Among these are several new specialties for passe-partout work. One of them is a passe-partout binder gauge, a neat device which quickly permits of the binding being placed on the glass of the passe-partout so as to give a perfectly even band, the width of which is exactly determined beforehand by setting the position of the gauge on its baseboard. Messrs. Fry have also some new styles of passe-partout binder in imitation of burr walnut and grained oak, these binding papers, especially when used in considerable width, giving an imitation of a wood frame. Gilt and pebbled white passe-partout binders of quarter-inch width are other new specialties, and still another is a convenient damper consisting of a water filled tube with its mouthpiece fitted with porous felt.

Messrs. Fry are also showing an entirely new pattern of film printing box, the special feature of which is the curved glass bed, on which the film negative is laid, the paper placed upon it, and uniform pressure obtained by drawing down a stout fabric apron which smooths out the printing paper and switches on the printing light as soon as it comes into its fully extended position. This printing box is supplied for use with ordinary current and, in an amateur model, for current supplied by a battery incorporated in the box. Two other printing novelties are spring-back printing frames, for development and print-out papers respectively. The former is specially designed for saving time in the dark room and may be adapted to form the top of a printing box; the latter provides a full view when printing on P.O.P.

A further new printing requisite is an orange mask for making white margin prints. A series of minute perforations are made parallel with the edges in the cut-out and serve as a clear and sharp guide when trimming the prints, and thus render the production of strictly "square" prints, with margins of exactly equal width, most certain and rapid. In addition, Messrs. Fry have some interesting novelties for the D. & P. business, and are also showing specimens of dry-mounting tissue which they are issuing in shilling and half-crown packets as well as in gross lots.

Stand No. 47—Iliffe and Sons, Ltd.

At this stand the publishers of our contemporary, "The Amateur Photographer," and of the series of numerous text books and manuals of photography, will have a display appropriate to the place which these publications occupy among photographic readers and students.

Stand No. 48—Jules de Gottal.

The manufacturers of the well-known French firm of Guilleminot, Boespflug et Cie will be shown at this stand, and will include the firm's series of dry plates, including the anti-halation variety in which a non-actinic transparent film is provided between the glass and the emulsion. Another notable negative-making material is the Guilleminot Folio-Brom, a stripping negative paper. Prints on bromide, gaslight, and P.O.P. papers serve to represent this side of Messrs. Guilleminot's business.

Stand No. 49—Mackenzie and Co.

The Mackenzie-Wishart system of carrying plates for exposure in envelopes, and the convenient slide by which one can dispense with a number of plate-holders, are so well known to many photographers that an exhibit of the appliances ought not to be absent from a gathering such as the Fair, which brings before the public the many and different photographic facilities which are available. Yet it is our experience that many of the more serious amateurs are not acquainted with this system; they should, therefore, take the opportunity of making themselves familiar with it.

Stand No. 50—All-British Photographic Competition.

At this wall space, as at many of the stands in the Fair, prominence will be given to the £3,000 competition, which is being held during the present year for photographs made with British cameras and with British materials. The competition is for prints from negatives on dry plates, a branch of manufacture in which makers in this country have, by common consent, been pre-eminent in the markets of the world. Full particulars and entry forms for the competition will be obtainable at the Fair at the stands of any of the promoting firms, *i.e.*, Messrs. Butcher, Elliott, Griffin, Houghtons, Ilford, Illingworth, Kosmos, Leto, and Wellington & Ward.

THE BUSINESS SIDE OF PROFESSIONAL PHOTOGRAPHY.

(We begin in this issue the publication of a series of chapters by an eminent portrait photographer, whose identity is somewhat thinly disguised by the pseudonym which he has chosen. Although the business side of photographic portraiture is a subject on which much can be written to the advantage of those less liberally endowed by Nature with the business instinct, it is rare in our experience to find one of the leaders in professional portraiture coming forward for the instruction of his brethren. The present introductory article is general in character. Succeeding chapters will deal more specifically with the relations of the photographer to his client, with systems of book-keeping and costing, and with the art of collecting accounts. Our contributor has a lively style in writing and it may, therefore, be hoped that the series of papers will obtain a close reading from those engaged in the business carried on in photographic studios.)

I. THE ECONOMIC POSITION OF THE PHOTOGRAPHER.

Firstly, I must apologise for the sub-title of this first chapter. It is both crude and commercial, and not at all in harmony with the tone in which any really high-class photographic studio is conducted. To suggest to an artist that he occupies an economic position is almost as bad taste as that of a certain noble lord who takes pleasure in pointing out to eminent and justly ruffled portrait painters that the value of their work is assessable at a price per square yard. Nevertheless, the professional photographer who balances cash, renders accounts, and performs other mundane but highly necessary duties, is a person conducting a business, and as such he occupies a very definite place in the world of commerce and economics.

It may be taken that all photographers realise their social position in the community. One can see this by the advertisements of "Studios for Sale." They are all either "High-class Studios," "Middle-class Studios," "Post-card Studios," or "Lock-up Studios"—whatever this last term may mean. Evidently a studio which will lock is the lowest type of studio obtainable.

What, I venture to suggest, however, is, that the average professional photographer does not usually realise the actual economic position which his particular business occupies, and consequently he is unaware of the advantages, disadvantages, or the ultimate possibilities of his particular studio as a source of revenue.

For the sake of simplicity we shall imagine the case of a studio which is of good average class—not one which is unapproachably exclusive, nor yet one which merely makes a profit on wages and materials; for this latter class of studio is really akin to any retail trader dealing in a cheap luxury, and the economic problems of such a photographer are not really coincident with those of the higher classes of studio. The position of an average good-class photographer is, therefore, as follows:—His portraits, besides being luxury articles, are commodities of which there is necessarily a very limited consumption. No matter how cheaply he may offer his goods to the public, nor how wealthy his public may be, photographs are of use to them only once in a period of years—and then only in a very limited quantity. After I have been photographed, have ordered, say, two dozen, and have distributed these among my friends, I am not inclined to order further copies of the same portrait unless they are offered to me at a very much reduced price. Supposing, however, that I am weak enough to do so, and I order a third dozen, any photographs in excess of that number will probably be not only worthless to me, but a nuisance. They would merely occupy cupboard space in my house, and would become what the economists term a "disutility." And these conditions will last for a period varying from five to twenty years, according to the extent of my personal vanity.

Now, compare this with the same individual's dealings with his baker. This refers to bread only. An individual consuming three loaves per week, at 10d. per loaf, would spend £6 10s. per annum. The photographer, on the other hand, may obtain scarcely that sum from one customer in a period of five years. Hence, if the photographer wishes to be as prosperous as the baker, he must obtain sufficient profit on his one quinquennial transaction to equal that of the baker during five years of daily custom. Further, the photographer does not always sell extra items such as miniatures and enlargements to each client; yet the baker sells regularly to the same customer many other articles which are a great deal more profitable than bread. Thus the baker may secure a steady and profitable business by having a limited number of customers who buy from him every day.

The recurring periods at which people are photographed vary, of course, in accordance with the rapidity of change in the person concerned. Children are therefore photographed more frequently than adults. Of the latter, women are more susceptible to the camera than men. In their case, however, it is their clothes which change. They themselves endeavour to remain as unchanged as possible, and it is the business of the gallant photographer to assist them in this. As for men, it is well known that they rarely enter a photographic studio save in order to terminate a feminine persecution. Men are in the habit of affecting an enormous contempt for the idea of being photographed. They enter the photographer's reception room with an air of apology for doing anything so vain and so effeminate. Creatures, however, who accept knighthoods and O.B.E.s with gratification, or who can listen with smug self-satisfaction to the magnification of their own abilities in an after-dinner speech, need have no fear that either their modesty or their manliness will be tainted in a photographic studio.

If, then, the photographer cannot increase the sale of his product to the individual, what other resources has the poor wretch who may harbour visions of one day possessing a sufficient fortune wherewith to retire from business, buy an estate, and become a gentleman? He has no other course but to increase the number of his customers. To a merchant or manufacturer this normally presents no great difficulties. They say to their minions: "Let us now send our travellers abroad, and open up an international trade." Or, "Let us issue a catalogue, and sell our goods through the post." But the poor photographer cannot do either. His customers must come to him in person. He may consider the hiring of an operator whom he could send to scour the country. But this involves heavy hotel expenses and train fares, which would probably absorb all his profits. Thus, a photographer situated in a small town may with difficulty achieve a comfortable retirement, but he can never hope to purchase either the estate or the gentility.

This brings us to the question of locality, a factor which, in the teeth of all the disciples of tone, composition, double, treble, or quadruple lighting, I hold to be the most important in the successful conduct of a photographic business. It takes undoubted precedence over capital, and is the *sine qua non* of financial success. First, however, we must appreciate the true meaning of rent, the underlying reasons why rents vary in different localities, and why, in short, one pays rent at all. The apparent reason is not the real one.

Let us imagine, for example, a small village possessing only one street, and let us suppose a shop-keeper sets up a business there. There will exist at first a certain moderate demand for his goods, and the price which he will be able to obtain will be relatively low. But the community increases, and gradually side streets are built adjoining the main one. Our shop-keeper now finds the demand for his goods to be increasing, and he is able to obtain a more satisfactory profit on each article. Now let us suppose that a second shop-keeper, possessing equal ability and capital, comes to the village, sees that it is a growing one, and sets up his business in one of the side streets. Previously, one shop was sufficient to supply the needs of all the village, and it would not have been profitable for this second shop-keeper to have commenced business there, but now the village is of such a size that this has just become possible, and the second man opens his shop, and charges somewhat less for his goods than his competitor in order to encourage custom in his side street.

At this stage the landlord of the first shop approaches his tenant and points out that here, in the same village, is a second shop-keeper, evidently possessing equal capital and ability, and who is apparently making a satisfactory living. "Yet you," he adds, "are making much higher profits than he. What is the reason of this? It must be solely on account of the premises which you occupy. As these desirable premises are mine, I must ask you to hand over to me each year those surplus profits which you are thereby able to make." Thus the premises of the first shop-keeper yield rent.

Similarly, as the community increases still further, and the demand for goods becomes still greater, a third shop-keeper may arrive on the scene and set up business in a still less favourable locality. Provided he, too, can make a reasonable living, the business of the second shop-keeper will be found to yield a surplus over that of the third, and he, too, will be required to hand over that sum to his landlord.

This method of viewing one's rent in the light of a surplus created by reason of the premises—and not as an expense deducted from a hard-earned profit—is a very comforting one.

My reason, however, for thus dragging my readers through the morass of an economic theory is to point out an important fact connected with professional photography. If rents were always assessed according to the surplus created in each case, this world would be a happier place. But as, in practice, the rent of each building tends to be a fixed one, and as, also, the amount of capital and personal ability possessed by different tenants tend to vary, it becomes possible that the same premises in the hands of a new tenant may be found to produce a very much smaller surplus than should normally be created. Thus the wretched tenant is compelled to hand over each year a sum of money which is not surplus at all, but a part of his private earnings.

This may be the result of subnormal ability or capital on the part of the tenant, but it may also be on account of the unsuitability of the kind of business to the premises. Now, a photographic business is a peculiar one, and because a certain surplus or rent has been yielded under the occupation of any other type of business dealing directly with the public, that is no criterion as to the surplus which a photographic studio would create. This law is evidenced by the fact that it is only in the suburbs or in small towns that the use of a shop or ground-floor premises is an economic possibility for a photographer. Few studios in fashionable or central localities can afford such a luxury.

The average trader who occupies a shop gets continuous custom all day and every day; the photographer only intermittently. These unused intervals yield no rental surplus. On the other hand, it would be equally impossible for the shopkeeper to carry on his business successfully in the photographer's upstairs premises. And here the photographer gains. Such premises being usually assessed at their probable value to a purely commercial firm, and not with a view to their occupancy by a photographer, the rental surplus which the rooms yield to him is really greater than that which he is required to pay to the landlord. It is, of course, unnecessary to inform one's landlord of this fact. So long as the photographer possesses space at his doorway in which to display his work, that is all the street publicity which he requires. The woman who espies an article of clothing in a shop window, and conceives a desire for it, enters the shop and makes her purchase —frequently on the spur of the moment. If she were obliged to climb a stair in order to do so she would probably return home without the article. Her portrait, on the other hand, is a premeditated act. It is preceded by an appointment, and after due consideration.

Linked with the obvious advantages of a well-populated area to a photographic studio is the extraordinary magnetic effect which such an area seems to exercise over persons not living in it. Thus a provincial photographer is not only faced with the difficulty of maintaining himself out of the precarious patronage of a thin population (in the numerical sense, of course), but he has the additional hardship of witnessing much of what should be his custom drawn London-wards, or to a larger town, or to a more fashionable district than his own. The public will not listen to his arguments, which are obviously the outcome of a natural but provincial jealousy; and they themselves have their gaze turned toward what they consider fashionable, with a paralytic fascination similar to that of a hen with its head on a chalk line.

The reasons for the super-normal financial success to which, for instance, a west-end London photographer may attain, are therefore obvious. He has not only a very large population at his disposal, wherewith he can multiply the comparatively small individual consumption of his product, but he has also the advantage of an enormous floating or visiting population not counted in the census returns. All these people "up from the country," are possessed of money saved, maybe for months, in order to "buy it in London." No matter if they pay double the provincial price for less than provincial quality, they will proudly show the article to their secretly envious friends, saying "I got it at So-and-So's—in London, you know." Or, if they have passed more than a week or ten days in the metropolis, they will probably call it "Town," having acquired the language.

For all these advantages of locality the London shop-keeper has to pay very sweetly in rent. But, as already pointed out, the photographer, in his upstairs premises, gains more from good locality than he is required to pay for. Hence, a west-end London studio should make more profit in relation to capital and personal ability than any other.

All this is very galling to the provincial photographer, who may not possess sufficient capital to remove his business to so coveted a position. On the other hand, he should bear in mind for his comfort, that there must be many photographers in London who could not scrape a living in the provinces. To this the London photographer replies: "Who wants to?" And there the matter rests.

Next in importance to locality comes the social status of the studio. This depends entirely on whether one wishes to dispense art at a high figure, or photographs at a low one. Both now form an equally precarious means of livelihood. As a choice, however, between two methods of attaining to poverty, it is perhaps better to favour the former, and to grow poor on art. There are, of course, definite limits, in any one town or district, beyond which it is not possible to rise in the social altitude of one's business. In a large community such as London or New York, for example, a photographer may betake himself and his camera to a private mansion, fix a brass nameplate at his door, charge ten guineas per dozen, and become, like Pooh-Bah, a very exclusive gentleman. In less populous areas, however, this is economically impossible. One can be a gentleman, but not exclusive. Like the geometrical point, such a firm would have position, but no magnitude.

The third factor, and next in importance, is capital. This, fortunately, does not need to bear so high a relation to profit as is the case in other kinds of business. Its use, in fact, in a photographic business is very limited. To a man who buys and sells goods, capital is everything, because the more he possesses the more goods he can buy and sell. To the photographer, however, after he has furnished his premises, bought his apparatus, procured a reasonable stock of materials, and placed a certain sum in the bank, extra capital is useless. So long as he remains in that locality, and conducts a business of that particular class, any amount of surplus capital will never increase his profits. This is another point in which photography seems to differ from almost all other kinds of business.

Fourthly, we have personal ability. In this case I refer to artistic ability. To those who would challenge me for placing this factor last, I would point out that this article professes to deal with only the business aspect of photography—that aspect which measures success by net cash returns. And as there are so many photographic firms who, up till recently, used regularly to produce substantial profits, and who showed no evidence of artistic abilty at all, this factor in professional photography must have very little importance indeed. Certainly, art in a man's portraiture will not be observed by the public if his studio is rented below a certain figure. Thus we have the woeful corollary that a brilliantly artistic photographer in the provinces, or in a suburb, is an example of a wasted life. However great a genius, he can never achieve more than a local fame. His work may be well known throughout the country, or the world, to those who frequent photographic exhibitions; but to the general public he is born to blush unseen, and waste his art upon suburban air.

If, however, we take personal ability to mean "ability to please the public," then the position of such a photographer is briefly as follows: Since he has found some means of satisfying the local public taste to a greater extent than his competitors, he will be able either to charge higher prices or he will create a larger clientèle. This means that he will make larger profits than his rivals, although they may be equally well placed as regards locality, capital, and class of business. The surplus profit which he thus makes is, therefore, another form of rent; but the result, this time, of his own exceptional abilty. This, which is known in economic parlance as quasi-rent, belongs to the man who creates it, and not to the landlord.

This very just law is, unfortunately, influenced to the bad by that tyrant, locality. The local public, as already explained, will flock inevitably to the more fashionable district or town; and while such a photographer will always reap a certain reward for this special ability, he will never gain the reward which is really his due unless he improves his locality to the maximum. In this country this can only be achieved by removing his studio to the west-end of London. There he will obtain full credit for all his skill, as well as credit for much

that he never aspired to. He will yield to himself a maximum locality-rent, the fullest quasi-rent, together with the highest possible social-rent. All his work will be considered artistic, the public will breathe his name with awe, and his clients will flaunt examples of his portraiture in the faces of provincial photographers.

To borrow a line from "The Beggar's Opera," "Is there aught else on earth desirous?"

PELHAM SWINTON.

PHOTOGRAPHIC DEALERS' ASSOCIATION.

THE Annual Congress of the Photographic Dealers' Association will take place at the Photographic Fair, which will be held at the Horticultural Hall, Westminster, from Monday, May 1, to Saturday, May 6, inclusive.

Congress tickets will be issued to members. The cost will be 2s. each, and by the kindness of the promoter of the Fair, Mr. Arthur C. Brookes, the ticket will entitle the holder to admission to the Congress, and to the Fair at any time during the week.

The annual dinner will be held at the Holborn Restaurant on May 1. Ladies will be welcome. The dinner promises to be even more successful than the last. The reception will be at 6.30, dinner at 7. The dinner will be open to all interested in the photographic industry, including professionals. A first-class musical programme will be provided, and speeches will be reduced to a minimum. Tickets will be 10s. each.

At the request of members an outing has been arranged for May 3. Char-à-bancs will attend the Fair at 10.30 a.m. to convey the party to Windsor, where a lunch will be provided. After lunch a launch will be in readiness, and the party will be taken on the river to Marlow. This trip includes some of the most charming scenery on the Thames. Tea will be provided on the launch, and the char-à-bancs will take the party back to London. The cost of this outing, including lunch and tea, will be £1. Ladies are invited.

It is felt that this year's Congress is the most important one in the history of the Association. The very difficult conditions which have prevailed since it was formed in May, 1914, have naturally retarded its progress somewhat. Conditions are now happily, improving by leaps and bounds, and the Photographic Dealers' Association will become of more vital importance to the dealer every day. A good attendance at the general meeting will do more than anything else to encourage officers to persevere in their efforts to maintain and improve the photographic trade. It is, therefore, clearly in a dealer's interest to make a real effort to be present.

AN EXPERIENCE IN MAKING D. & P. TANKS FROM DRAIN PIPES.

THIS being the time when many photographers are busy opening up, extending, and generally preparing for the season's D. & P., the following experience which recently befell me may be interesting, and although I do not expect any reader to "go and do likewise," but advise a more cautious and premeditated policy, there may be something of practical value in what follows.

Through circumstances which need not be recorded, a certain business took a lightning decision to extend, in order to undertake a new contract, the extension necessitating the fitting up of new workrooms. As it happened, everything was at hand except a set of deep spool developing tanks. A perusal of manufacturers' catalogues brought to light tanks that were too large—and too expensive—and tanks that seemed a trifle small for the business in view, and all of them were many miles away, and no indication was given of whether delivery might be expected in two days or two weeks, or when. It was then that I remembered that an American photographer had made his own tanks out of drain pipes, but, of course, I could not find the particular issue of the "B.J." which described them in detail, so I set out to see what I could find on chance.

I soon found that the only common pipes were ridiculously small for the purpose in view, but there was a size *manufactured* (2 ft. 6 in. × 1 ft. 3 in.) which would just about do. At first it seemed that this size had never got beyond the manufacturer's premises, but at last I found a merchant who said he could supply at once. In the meantime I had made various inquiries about making bottoms for the pipes, and some had advised me to block the flange with wood, while others said slate and cement. I decided on the latter, with the addition of a layer of chicken netting for strength.

The pipes arrived. They were to be used on a floor which could only be approached viâ four flights of narrow stairs. They weighed over 1 cwt. each, and were about as wide as the stairs. But I will cut out the upstairs trip. We got them up—eventually. Then two of us set about cutting the slates. Not being *au fait* with the slate-chipping art, we drilled holes at half-inch intervals before attempting to break. It looked easy, but that was all. Next the cement. We calculated that about half a stone would do the lot, but those flanges swallowed over a stone each, and then yawned for as much again. With the wire net buried in a 1½-inch layer we gave it up and retired, myself to dream that it was a busy summer day, with still 200 spools to go and the tank bottom dropping from under the metol-hydroquinone-pyro formulæ. Next morning we filled each flange with a T-piece of 3 × 1½ wood, and re-cemented the edges. Then I calculated for volume $\pi r^2 \times h$ with 277 cub. inches to the gallon, and 9 gallons to the lb., etc. Being somewhat fagged, I first calculated with πr^2, and, seeing the result, I sent out for timber to reinforce the floor. Then I discovered the error, finding the approximate volume to be about 14 gallons and the gross weight a little over 2 cwt. for each tank. The timber having arrived, we decided to use it, and with three 7 ft. lengths of 3 × 2 laid on their edges, 2 ft. apart, and covered with cross-pieces of ¾-in. floor-boarding, we spread the total weight over 14 sq. ft.

The next day we filled the tanks. Since then they have been emptied once—syphoned with rubber tubing to an outlet in the wall at a lower level than the inside tank bottom—and the bottoms examined. Apparently there had been no cracking or leaking, but in spite of this seeming success, if I did another I would first consult a good text-book on cement. One authority advised me to give it half an hour to set; another said a day; another, two days; another, four. Some thought it wanted sand; some that it must be very wet. I tried to steer a middle course, but, in face of the differing opinions, I felt uncertain about a very important point.

The necessary rods, which had to be of varying lengths on account of the curvature of the pipe, were cut from copper wire and well silver-plated in used hypo solution. One pound of wire made two sets, each rod having a dip of 3 inches.—D. P.

FORTHCOMING EXHIBITIONS.

April 21 to May 11.—Hammersmith Hampshire House Photographic Society. Particulars from the Hon. Exhibition Secretary, J. Ainger Hall, 26, Bishop's Mansions, Bishop's Park Road, London, S.W.6.

April 22 to May 27.—Royal Photographic Society. Colonial prints arranged by "The Amateur Photographer and Photography." Open daily from 11 to 5 p.m. 35, Russell Square, London, W.C.1.

May 1 to 6.—Photographic Fair. Horticultural Hall, Westminster. Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1.

June 1 to 30.—Royal Photographic Society. Prints by Pirie MacDonald, of New York.

September 9 to October 7.—London Salon of Photography. Latest date for entries, August 30. Particulars from the Hon. Secretary, London Salon of Photography, 5a, Pall Mall East, London, S.W.1.

September 11 to 15.—Professional Photographers' Association, Princes Galleries, Piccadilly, London, W. (Trade and Professional). Hon. Secretary, Richard N. Speaight, 157, New Bond Street, London, W.1. Also foreign invitation loan exhibition of professional portraiture. Hon. Secretary, Marcus Adams, 43, Dover Street, London, W.1.

September 18 to October 28.—Royal Photographic Society Annual Exhibition. Latest date for entries by carrier, August 25. Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

Mask Making.

The following method is a very quick and efficient way of making paper masks which are at the same time strong and neat. Mark out on a piece of black paper the size of opening required, then cut it out roughly about a quarter of an inch larger all round. Obtain some lantern slide or passe-partout binding, and fill in the unnecessary part of the opening. It is best to use two layers of a thin binding rather than one of a thick variety.

In ruling out the opening required continue the pencil lines to the edge of the paper, this serving as a guide for placing the binding in position.—A. W. Woodmansee.

On Not Waiting for Business.

Much is written nowadays about encouraging public interest in photography, but the line taken usually by our class is that of the doctor who cannot seek publicity beyond having his name-plate outside his surgery. Why do we not force ourselves on the public as the manufacturer who has goods to sell, and knows their value to the extent of sending out his commercial travellers to push his lines. Surely photographers believe in the value of the articles they offer? For too long has professional etiquette stood in the way of photographers really reaching the public. Why should not the proprietor of a business, or the chief assistant, too, in these slack days, go out with the idea of looking for business? Much might be cultivated by offering suggestions to the public. A row of shops is being demolished and a large warehouse will shortly be in course of construction. Would it not interest those shopkeepers to have, perhaps, their first, but certainly their last photograph of their premises? The contractor for the demolition, the builders of the new premises, the fitters of shop windows, all should be approached, and suggestions should be made. They may be only too glad to hear them, and by all means leave them examples of similar work done by you, with your address. Persist in calling if your first approaches are not successful. A business man likes to see that you are dogged.

No effort should be spared to find business in these quiet times, and measures that were turned down as not worth while in normal times should be given a trial. Anything that helps to clear establishment charges should be considered. A certain business has made a remarkable success of copying photographs and making enlargements of people deceased, and this has been built up by obtaining details from local papers in the outskirts of a large town, of visiting the addresses of the relatives after advising them by postcard, and then gaining their confidence by showing work already done, and refusing any payment until the work is returned completed. This is now a very successful business, and very fully justifies the forethought of the method of looking for business, and not merely waiting "for something to turn up."

On the subject of copying, how often is this held up as a most difficult business, and although photographers do not point blank refuse it, such a price is put on it as to prove prohibitive, and with the object of discouraging the work. Yet it can be made to pay an assistant's wages, if interest is taken in it, and the work is encouraged, and cultivated. While on this subject, it may be mentioned that many people on their annual seaside holiday, have their photographs taken, and very frequently soon after their return take a copy to a local man for an enlargement. What opportunities the seaside photographer is missing here. A month or so after the holiday season has slackened, or towards Christmas, when trade is slack, a judiciously worded letter in the personal strain, sent to the people reminding them that an enlargement would revive pleasant memories might be sent to the home addresses of those clients, together with a postcard copy of the original photograph. In many cases, this would be productive of business.

A further sphere for activity is amongst the clergy, for as a class they are very shy of the studio, and many only visit it under pressure, when a bazaar is to be held, and their photographs are wanted for sale "towards the cause." Many clergy dabble with photography, and this kindred interest at once established a welcome to the photographer calling on the clergy. There are many cases where a good connection has been built up, for not only were the photographer's efforts appreciated in portraying events in the parish, such as groups of choir, clergy, scouts, guilds, and societies, but much work was afforded in doing lantern slides from a series of negatives to illustrate lectures, and the photographer was recommended amongst other clergy. All these circumstances help to the building of a connection, and cannot be ignored.

The object of calling attention to such matters is to ask the photographer to go about with an eye for business. There is a case of a large combine opening out many branches in a large provincial city. Many shop-fronts were altered where premises had been acquired, and an amateur photographer seeing the chance of using some of his spare time, secured the work of supplying photographs of all the branches. On occasions of special dressing, such as at Christmas, he is regularly asked to photograph all the windows, and a very good result has accrued from his seeing eye, which led him to interview the secretary and secure the job.

In conclusion, look about you, encourage the assistants to bring in their ideas, and where there are six pairs of eyes on the look-out for business, there will be more fruitful results than where the method prevails of waiting in the studios for brighter days. There is business, go out, and suggest it, and then you will secure it.—H. J. K.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, April 10 to 13:—

Cameras.—No. 10,219. Photographic cameras and view-finders therefor. H. Bishop and W. Langdon-Davies.

Cameras.—No. 10,705. Photographic cameras and printing-apparatus. H. R. Eason.

Printing-out Paper.—No. 10,363. Photographic printing-out paper and prints made therefrom. J. A. Johnson.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

Kodak Tested Chemicals (Design).—No. 421,047. Photographic chemicals. Kodak, Ltd., Kodak House, Kingsway, London, W.C.2, dealers in photographic materials. November 30, 1921.

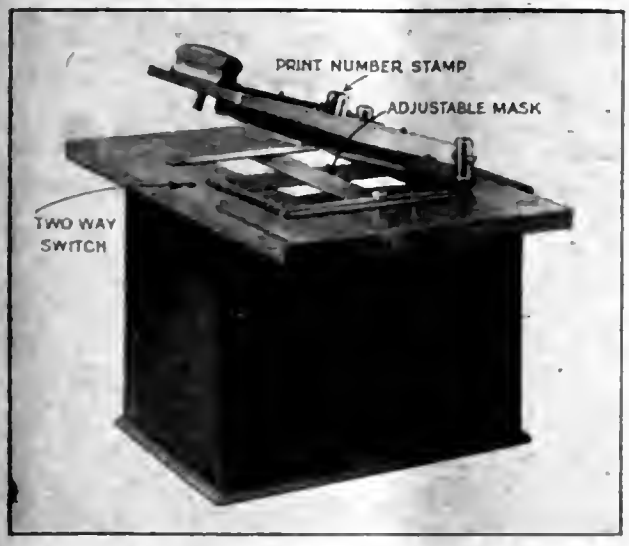
Photographic Test for Old Masters.—It is stated in the daily Press that photography has proved the authenticity of Rembrandt's picture, "The Good Samaritan," which is in the Wallace Collection, and said not to be a genuine Rembrandt. Professor Laurie, of the Heriot Watt College, Edinburgh, whose work in deciding on the authenticity of pictures by taking enlarged photographs of portions of them has already been described in our pages, was consulted. He took photographs of part of the picture, and compared them with photographs of other pictures known to be the work of Rembrandt. "The photographs show the identity of the brushwork in the two pictures," he told a "Daily Mail" representative. "It is not possible for the magnified brushwork of two different painters to agree so closely."

The Cinema as a Teacher.—A congress is being held this week at the National Arts and Crafts Institute in Paris to consider the possibilities of instruction by means of the cinema. The Congress, presided over by M. Gaston Vidal, Under-Secretary of State for Technical Education, is dealing with the cinema as an aid to the choice of a profession; technical, industrial and agricultural education, and artistic education, this section being organised under the anspices of the Council General of the Seine and the Paris Municipal Council. Experts connected with the development of the cinema have been invited to take part in the Congress; more than 500 have consented to give the Congress the benefit of their experience. Among those who will address the meetings are M. Louis Lumière, one of the pioneers of the cinematograph.

New Apparatus.

The XL. Film Printer. Made by Brodrick, Ltd., 50, High Street, London, W.C.2.

THIS printing box for single or band film negatives is now supplied by Messrs. Brodrick at the reduced price of £7 10s. The metal box is provded with a most substantial oak bed, measuring 20 x 13 inches, and fitted with a pair of masks adjustable to negatives from the very smallest size up to the full half-plate taken by the machine.



The pressure back, operating the lamp switch is most solidly made in the shape of a metal framework, on which the wooden pressure back proper is spring mounted. The latter is fitted with an automatic numbering device by means of which a series number may be impressed on the back of each print which is taken off. It is a thoroughly well made piece of apparatus.

Eastman Portrait Diffusion Discs. Made by Kodak, Ltd., Kingsway, London, W.C.2.

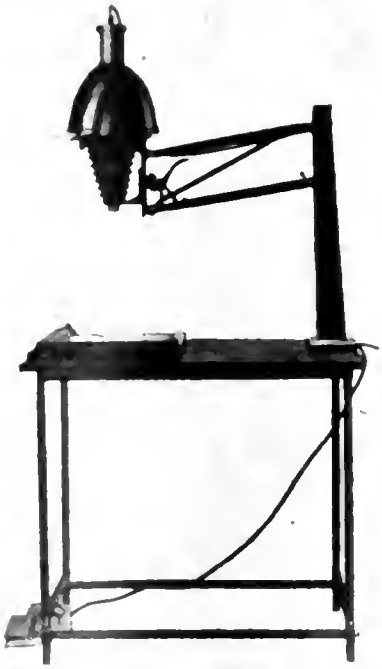
WHEN the ingenious plane-parallel "light-filters" were introduced at the same time as the first model of the Eastman Projection Printer, for the purpose of introducing certain degrees of diffusion into the enlargements made with that instrument, it was natural to assume that similar "diffusion discs" might be employed on camera lenses for introducing a certain degree of softened definition into the negatives made with anastigmat or other lenses. As long

ago as August, 1920, we published an article by Mr. C. W. Frederick, the inventor of the discs, in which it was stated that those fitted to the enlarger were, however, not found suitable for camera use in the making of negatives, but that further experiments were in progress for the purpose of devising filters of a suitable kind. These have now been placed upon the market, and are seen to consist of what are apparently plane-parallel glass discs provided with a series of extremely slight corrugations in concentric circle formation. In the case of the enlarger discs, these corrugations were in star form. The discs for camera use are made in two types—A and B—the former exercising a very slight softening of the definition; so slight, indeed, as to retain in considerable measure the sharpness given by the lens to which they are fitted. The B type gives considerably more diffusion, but even in its case the effect would by no means be called "out of focus." On the other hand, it corresponds with a degree of moderate diffusion somewhat resembling that which is obtained by a moderate employment of the diffusion adjustment of a Dallmeyer patent portrait lens. Prints made with the filters of both types show that the softness of definition is obtained without any sacrifice of the brightness of contrast resulting from the prevailing conditions of lighting and exposure of plate.

It is scarcely necessary to point out that many possessors of large anastigmat lenses will welcome these discs as a most convenient means of obtaining negatives of soft definition when the subject or the fashion of the moment renders such quality desirable. Again, many a photographer of modest means feels himself compelled to obtain one lens for both studio portraiture and such outdoor work as groups or architecture. For the latter he must, perforce, have a lens giving sharp definition, and hence the facility of obtaining soft focus in his studio negatives when he so desires is one which will substantially add to his resources. Each type of disc is made in two sizes—No. 1, of 3½ inches diameter, price 34s.; and No. 2, of 4½ inches diameter, for 43s. Adjustable disc holders, for fitting to the hood of the lens, are supplied in two sizes, No. 1 for lens hoods from 3 to 4½ inches diameter, price 23s., and No. 2, for lens hoods from 4½ to 5½ inches, price 29s. 6d. Those in London during the Fair Week may be interested in the intimation that the discs may be tried in the studio of the Kodak Co. in the Kingsway building.

The Kodak Projection Printer. Made by Kodak, Ltd., Kingsway, London, W.C.2.

THIS apparatus is a smaller model of the Eastman Projection Printer, possessing the characteristic features of vertical build and self-adjusting focussing of the latter, but differing in a number of



minor respects appropriate to the special work for which it is designed, namely, the enlargement of amateurs' negatives, either film or glass. The apparatus takes negatives up to and including 5½ x 3½ and 5 x 4 inches, from either of which enlargements may be made on any scale from 1½ to 6 diameters. The ingenious self-focussing adjustment by a cam mechanism, introduced in such refinement in the Eastman Projection Printer, is employed also in this apparatus with certain facilities added. One of these is that the two arms of the link work which support the camera and light-box work sufficiently stiffly to render unnecessary any locking of

the apparatus in any position. Thus the operator simply raises or lowers the camera, according to the degree of enlargement, and it "stays put" in any position. Another feature which is new in this model is a very ready adjustment by means of a toothed wheel for the initial setting of the enlarger.

The camera is fitted with universal masks, providing a truly rectangular masking of any size, for the production of white margin enlargements. For one of these masks, namely, that in the position which renders it liable to be shifted, a lock is provided. The negative carrier has a clip for holding a film negative in position, and also a sliding pointer which serves to permit of a whole series of small negatives of the same size being placed in the same position in the carrier so as to obviate alteration of the setting of the easel or paper carrier. The apparatus, although apparently of most simple construction, actually abounds in little devices such as these for the saving of time and labour. Illumination is by a 200-watt Mazda lamp, and the camera is fitted with an *f*/6.3 anastigmat. The whole apparatus is of the best in design and construction, and will come as a boon to individual producers of enlargements from amateurs' negatives. The price complete with lamp and lens is £50.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SUNDAY, APRIL 30.

Hammersmith Hampshire House P.S. Outing to Egham.

TUESDAY, MAY 2.

Royal Photographic Society. "Reproduction of Pictorial Work." E. L. Turner.

Bournemouth Camera Club. "Amateur Photographer" Prize Slides, 1921.

Cambridge Photographic Club. "Paget Process of Colour Photography." C. B. Coulson.

Hackney Phot. Soc. Annual Dinner.

WEDNESDAY, MAY 3.

Croydon C.C. "The Story of a Photographer with Two Lenses." A. Dordan Pyke.

Rochdale A.P.S. "Home Portraiture." T. Crabtree.

THURSDAY, MAY 4.

Gateshead Camera Club. Annual Meeting.

Hammersmith Hampshire House P.S. "The Story of the Photographer with Two Lenses." A. Dordan Pyke.

SATURDAY, MAY 6.

Hammersmith Hampshire House P.S. Outing to Barking Creek.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, April 25, Mr. E. W. Mellor in the chair.

The first part of the proceedings consisted in the annual general meeting of the Scientific and Technical Group. Mr. O. Bloch read the report of the committee, briefly reviewing the meetings which had been held, and the inauguration and publication of the Group's valuable work, "Photographic Abstracts." On the proposition of the chairman, seconded by Dr. Slater Price, the report and balance-sheet were adopted. The result of the ballot for the election of committee of the Scientific and Technical Group was:—Messrs. O. Bloch, H. W. Greenwood, K. C. D. Hickman, J. W. Grundy, and S. Read.

Mr. Mellor then vacated the chair in favour of Mr. Dudley Johnstone, who first declared open an exhibition of prints by Colonial readers of the "Amateur Photographer."

He then called upon Dr. Slater Price to deliver a lecture on "Gelatine."

Dr. Price read a most interesting paper, illustrated by a great number of experiments, describing the present state of knowledge of the properties of gelatine, as ascertained from modern work in colloid chemistry. He provided an introduction setting forth and illustrating the properties of the two different types of colloid, suspensoid, and emulsoid, and dwelt at length on the character of gelatine as an amphoteric substanee, namely, one which functioned as an acid toward bases and as a base towards acids. He gave, in popular and extremely lucid form, an account of recent work, done chiefly in this country, Austria and America, which had contributed to a better knowledge of the chemical and physico-chemical properties of gelatine, showing how some of the apparently anomalous results of earlier investigators had recently been made plain. He concluded with a discussion of the processes which take place in the hardening of gelatine.

A short discussion followed, in which Messrs. Storr, Hickman, and Grundy took part. On the proposition of the chairman, a most hearty vote of thanks was accorded to Dr. Slater Price, and to Mr. Rawling, who had performed the many experiments, not one of which failed to "come off."

CROYDON CAMERA CLUB.

Mr. F. C. Reynolds, who has made light and colour a special study, read an instructive paper on "Some Aspects of Colour Vision." As is his wont, many pretty and striking experiments were shown, nicely interspersed between more solid matter.

Little had direct bearing on photography, save a consideration of screen-plates, and some artificial equivalents of daylight, which are selected for brief notice. Daylight, he pointed out, is obviously not constant in spectral quality, and an average north light is adopted as the best standard, if somewhat a loose one.

Wratten's dyed gelatine filters, for use with metallic filament lamps, were shown. Edison and Swan employ suitably coloured glass for the bulb, and claim a loss of only 35 per cent. of the light emitted by the glowing filament, a claim, in the lecturer's opinion, which certainly errs on the side of numerical modesty. Messrs. Chance also manufacture sheet glass coloured to transmit only rays approximating daylight. In the Sheringham system a reflector is used, which reflects the colours wanted, whilst absorbing the excess of those which require damping. The illumination by this method is, however, materially reduced.

Among many other diversions was shown the "Plastograph." Spectacles fitted with one red and one green gelatine filter throw into stereoscopic relief two overlapping pictures similarly coloured. Mr. Reynolds was lucky enough to pick up the pictures from a stall in Farringdon Market for a penny apiece, securing a fashionable reduction in price by pointing out they were evidently throw-outs, as the faulty registration indicated.

In the discussion, which was contributed to by many, Mr. Hibbert mentioned that successful Autochrome portraits had been taken with artificial illumination. An enclosed electric arc was employed supplemented by two high candle-power half-watt lamps, one with a Lumière "Virida" green filter in front. The respective distances of the half-watt lamps from the sitter were determined by trial and error, their positions being varied till true colour representation was obtained. A most hearty vote of thanks was accorded Mr. Reynolds with much acclamation.

The club's Easter outing was held on the Monday, and proved a great success, despite distinctly nippy weather conditions. The Leatherhead district was visited, and things warmed up mid-day at the "Running Horse" at Mickleham, from where the party emerged full of enthusiasm and high resolves. Two teas were subsequently indulged in, and it is believed some photographs were taken. Reserved carriages in the train both ways gave the customary feeling of superiority over the cheap tripper.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

The Council of the Association met at 35, Russell Square, on Friday, April 21, Mr. A. Corbett in the chair. There were also present the President (Mr. A. Swan Watson), Messrs. Marcus Adams, Angus Basil, A. Bennett, Frank Brown, W. B. Chaplin, Chas. Dickinson, W. E. Gray, Gordon Chase, H. A. St. George, George Hana, R. Haines, W. Illingworth, R. Lang Sims, F. G. Wakefield, W. Wedlake, and the Secretary (Mr. Alfred Ellis).

Apologies for absence were received from Messrs. Spink, Chidley, Chapman, Lambert, Wheeler, and Speaight.

The Secretary reported that he had received a letter from the Royal Photographic Society referring to the Fox Talbot Memorial Fund, and stating that the Society would gladly welcome any assistance. He had replied that he was afraid the Association could not do very much without the consent of the members at the general meeting, and suggesting that an appeal from the President of the Royal Photographic Society would be more effective than any he could make.

The Secretary also reported that the President of the Royal Photographic Society had written inviting the members of the Association to visit the Society's exhibition on Friday, September 15, from 11 o'clock to 5 p.m., and on Saturday, September 16,

from 11 to 1. The Secretary said he had written saying he was sure the members would much appreciate this kind thought. The exhibition would practically open when the Congress closed.

The Chairman remarked that they were largely indebted to Mr. Adams and Mr. Lambert for this concession, which the Council much appreciated.

The Secretary read a letter from the Editor of "La Photographie" referring to the centenary of photography, to be held in Paris in 1924, and asking for support. He had written saying he was sure they would do what they could, and inviting their friends across the Channel to come over and visit or send exhibits to the Association's Congress.

A Problem of Copyright.

The Secretary reported that a member had written asking for advice as to copyright. He took photographs of the child of a lady friend, not charging for the sitting. The mother bought some of the prints, and held that it was not a free sitting, as she had wished the child to be photographed. He now wished to dispose of the negatives to a firm of paper manufacturers.

The Secretary suggested that in this case, as the mother bought copies, the photographer could not claim the copyright. The member had replied that, to avoid any unpleasantness, he would not dispose of the negatives. The Council confirmed the action of the Secretary in the matter.

The Secretary read a letter which had been addressed to the President by the London Press Exchange on the subject of co-operative advertising.

The President said he had replied that at present the Council had too much work on hand to consider the subject fully. The suggestion was that professional photographers should combine in a scheme which would increase the demand for portraiture. Mr. Sykes had had a wide experience of collective or association advertising, and by his schemes had greatly increased the consumption of various articles. The President added that Mr. Bell, Editor of the "Professional Photographer," had written to him saying he could give some remarkable figures as to how co-operative advertising had improved business in America.

Mr. Basil observed that a good case had certainly been made out for some such scheme.

Mr. Bennett agreed that if a good scheme was adopted the demand for portraiture might be greatly increased.

Mr. Chase said a great many more men would be photographed for business purposes if the necessity was only impressed upon them.

Mr. Marcus Adams pointed out that six months previously he was asked to make inquiries as to the possibility of such a scheme, but, owing to the pressure of business, he had held it over. He feared it was hopeless to carry out such a scheme unless they had two or three thousand pounds for the purpose. And many of them would be willing to put down £10 without knowing more about it. He had worked out a simple scheme which, when the right moment came, he would ask them to consider.

Mr. Basil thought they could do nothing in a hurry. They needed first of all to impress the idea on the members generally.

Mr. Illingworth moved that some expert should be invited to give a paper containing information on this matter.

Mr. Adams seconded, and the motion was carried, the matter being left in the hands of the Congress Committee.

It was further agreed that the Secretary should write confirming what the President had already written as to the impossibility of dealing with the question until after the Congress.

Mr. Wakefield called attention to an advertisement in a newspaper in which a trade enlarger said, "We will help you to take good photographs. Call and talk over your photographic troubles." He strongly complained that this was taking the bread out of the mouth of the photographer for whom this trade house worked. The Chairman thanked Mr. Wakefield for bringing the matter forward, and said they would deal with it later on.

The Secretary read a letter from a provincial member in regard to a copyright problem. He was instructed to photograph certain original paintings, but the owners could not assure him that they possessed the copyright. The pictures were purchased before the last Copyright Act was introduced.

The Secretary said he had replied that under the old Copyright Act of 1862, when a picture was sold by the artist, unless at or before the time of selling an agreement was signed by the parties reserving the copyright, the copyright was lost. In the absence of an agreement the copyright lapsed and the picture could be copied by anyone. Under the new Act of 1911 the copyright remained vested in the artist unless he assigned it in writing to the purchaser of the picture.

There was useful information regarding copyright matters in the "P.P.A. Handbook," pages 16-33.

The Secretary read a letter from a member who asked for an opinion regarding his charges for special work away from his studio.

The Secretary had replied that it was difficult to answer the question without knowledge of his class of work. If he usually charged for outdoor work 10s. 6d. for a whole plate and finished proof, why not always charge in the same way, with travelling expenses extra? That was the usual way of doing it, although most firms charged a guinea for the first position, and half-a-guinea for extra ones.

In the course of the discussion which followed, it was suggested that it would greatly help members of the Association if standard rates could be published in the new "Record." Mr. Brown gave details of a case in which he was asked to take 12-in. × 10-in. photographs in a basement in which there were many mirrors. It was a long and difficult task, but the firm in question complained that his charges were too high.

The Chairman concluded the discussion by remarking that the important points raised would be debated fully as soon as possible. He hoped they would be able to help all members to arrive at a proper basis. In time no doubt they would be able to make standard charges for all classes of photography.

The Secretary said a letter had been received from a member who said he had had some trouble with his landlord under the Rent Act. It appeared he had been direct to the Association's solicitor, and the Secretary said he had informed him that as he had done that without any intimation to the Council, it must be considered a case in which payment would be between client and solicitor. He had written to Mr. Vaughan stating that if any member consulted him without any authority from the Council he was to consider it a private matter. Mr. Vaughan had concurred. The Secretary's action was confirmed.

Commercial & Legal Intelligence.

NEW COMPANIES.

R. W. Bell, Ltd. This private company was registered on April 18, with a capital of £500 in £1 shares. Objects: To take over the drug business carried on by R. W. Bell at South View, Forest Hall, Northumberland, and to carry on the business of chemists, druggists, opticians, dealers in photographic materials, etc. The first directors are:—R. W. Bell, South View, Forest Hall, pharmacy proprietor; Mrs M. G. Bell, 10, Briar Edge, Forest Hall; J. Scott, secr., 39, Windsor Terrace, Gosforth Northumberland, pharmacist. Qualification: 1 share. Registered office: South View, Forest Hall, Northumberland.

Royal Arms and Trade Marks Bill.—The text of the Bill to amend the Merchandise Marks Acts, introduced in the House of Lords before Easter by Lord Gorell, the Under-Secretary for the Air Ministry, was issued last Friday. It provides that where the Board of Trade are of opinion that a false impression as to the origin of any class or description of goods is likely to arise, the Board may make an order requiring an indication of origin—either of the actual country or of the fact that they came from outside the Empire—to be given by publishing notice of their intention in the "Gazette," giving all persons affected an opportunity of making representations on the point. A fine not exceeding £20 may be imposed under the Bill upon any person or association using in connection with trade without authority the Royal arms or any Royal device, or any arms or device closely resembling them, any title containing the word "Royal," or any name suggesting the patronage of the King or any member of the Royal Family, or connection with the Government, unless they were in use on April 10 last.

News and Notes.

TYNESIDE PHOTOGRAPHIC SOCIETY.—This society has changd its name to the "Newcastle and Tyneside Photographic Society" since its headquarters are in Newcastle.

THE BIGGEST AUSTRALIAN PHOTOGRAPHIC SOCIETY.—We learn from the Australian papers to hand this week that the Melbourne (Victoria) Camera Club now has a membership of 200, making it the largest photographic society in Australasia.

"F. W. P.," BRIGHTON.—A customer of Messrs. Hood & Co., Ltd., having the initials we have quoted, and resident at Brighton, who recently sent a small remittance to Messrs. Hood, but without giving his address, is asked to write again, in order that his request may be complied with.

PLATINOTYPE PAPERS.—The Platinotype Co. announce a reduction in the prices of Platinotype and Palladiotype papers of about 12½ per cent., which they have been enabled to make in part as a result of some reduction in the price of platinum metal, although the latter still remains at an exceedingly high level.

PICTORIAL PHOTOGRAPHY IN AMERICA.—The annual publication issued under this title as a selective record of the harvest of pictorial photography in the United States is announced to appear in October next. The selecting committee consists of Dr. A. V. Chaffee, Mr. John Paul Edwards, Dr. Arnold Genthe, Mrs. Gertrude Kasebier, and Mr. O. C. Reiter. From the circular which has been sent to us it would appear that the volume will be published by Mr. J. D. Drew, 63, Cliff Street, New York.

THE CITY SALE AND EXCHANGE sends us from its branch 90-94, Fleet Street, a bulky list running to 144 pages of all descriptions of second-hand apparatus, including folding cameras of all descriptions. The catalogue contains particulars of some of the firm's own specialties in the way of new apparatus, such as the Salex vest pocket focal plane camera and the Salex reflex camera, the latter an instrument which is supplied in 3½ × 2½ size, complete with *f*/4.5 lens, for £10 17s. 6d.

THE CHOICE OF A LENS.—Messrs. Ross, Ltd., have just issued an illustrated booklet containing hints and suggestions on the choice of a lens, in the text of which will be found much information written in non-technical language and conveying advice on the most advisable choice of a lens for different branches of work. The booklet includes particulars and prices of the Ross objectives of various types, and is obtainable free on application to 3, North Side, Clapham Common, London, S.W.4.

MESSRS. DALLMEYER'S NEW CATALOGUE of their well-known lenses is a handsome production which will perhaps invite perusal as much for the reductions in prices of many instruments as for the excellence of the printing. A feature of the list is the full particulars given of the many series of lenses and of the cameras of repute which can be supplied fitted with one or another of the Dallmeyer objectives. The list is obtainable free from Carlton House, 11d, Regent Street, Piccadilly Circus, London, S.W.1.

PHOTOGRAPHS NOT EVIDENCE.—During the hearing of a bigamy charge at the West London police-court last Saturday, evidence was being given by one of the secretaries of the Marriage Department at the town hall in Paris, when the prosecution sought to prove publication of the notice of intention to marry by producing a photograph of a notice stated to have been posted up at the town hall. The accused's counsel objected to this, as being unauthorised and secondary evidence. The magistrate upheld the objection, and excluded the question of publication of the notice. It was stated that the French authorities would not allow the original notice to leave the country; hence a photograph of it.

MESSRS. ROBBINS, MANISTRE (The London Camera Exchange), 2, Poultry, Cheapside, London, E.C.2, send us a copy of their 60-page list, just issued, of second-hand apparatus, offered at prices which represent systematic marking down in accordance with the reductions now taking place in the apparatus trade. The list includes an immense variety of folding pocket, reflex, Press, and other cameras, and has a particularly large section itemising the field, stand, and studio cameras of interest to professionals. Lenses also occupy a number of pages, so that portrait photographers revising or adding to their equipment are offered a favourable opportunity of doing so by paying a visit to this leading firm whilst in London next week for the Fair.

SOLDERING ALUMINIUM.—The following method has proved very satisfactory and far superior to and more lasting than any previously tried. Use a pure aluminium soldering "iron," which can readily be made from a piece of ⅝ in. or ¾ in. round or square aluminium; tin the parts to be soldered wth a composition of 81 per cent. tin, 16 per cent. aluminium, and 3 per cent. of copper. This is not a new composition, but in the proper method of preparing lies the success. After fusing the copper, add the aluminium a little at a time while constantly stirring with a piece of iron; then add the tin, and also a small portion of tallow; after the ingredients have all been added, care should be taken not to overheat.—"Amer. Machinist," through "Chem. Trade Journ.," March 31, 1922, 398.

OSRAM DAYLIGHT LAMPS.—A recent new introduction of the General Electric Co. is a metallic filament lamp in a blue bulb, the light from which approximates very closely to daylight in its spectral composition. The lamp is finding applications for many purposes where exact matching of colours by artificial light is of importance, as, for example, in drapers' shops, colour-printing factories and in museums and art galleries. It can be readily assumed that the lamps will be found useful in photographic workrooms, where the toning of print-out or development prints has to be done by artificial light. With P.O.P., particularly, it is by no means the easiest matter to judge correctly of the progress of toning except by examining the prints for a moment in daylight. Particulars of the lamps are given in a circular, No. O.S. 2706, now obtainable from the General Electric Co., Magnet House, Kingsway, London, W.C.2.

PHOTOGRAPHS USED FOR SMUGGLING.—In an "Evening News" special article on cocaine smuggling it is stated that "a man in Manchester was suspected of receiving cocaine. All kinds of traps were unsuccessful, and for months the detectives could not discover his source of supply. Then they noticed that a number of photographs, but only one at a time, reached him through the post. They were enclosed in envelopes marked 'Photograph only,' and the flap was left open for inspection by the postal authorities. Ostensibly to protect the photograph two pieces of cardboard were inserted in the envelope, an elastic band covering the whole contents. Between the two layers of cardboard was a thin sheet of tissue paper, and there was a similar sheet between the cardboard and the photograph. The cocaine was very carefully dusted over the tissue paper, and to the astonishment of the authorities a remarkable quantity was conveyed in the one envelope."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

CONVECTION CURRENTS.

To the Editors.

Gentlemen,—The words "either one strip immediately above another, or," in the second paragraph of column II. of the communication "On Convection Effect in Photographic Bathing Operations in the Absence of Agitation," on p. 110 of the February 24 number of your journal should have been either qualified or deleted. That this was not done is due to an oversight on the part of the writer when gathering the established facts from his note-book, and endeavouring to describe them as concisely as possible. The full sentence reads: "If two or more strips of film are arranged in a long tube, either one strip immediately above another, or with intervals between each strip, and bleached simultaneously, each strip shows the effect independently of its position, and in a degree varying only with its length."

Tests had, indeed, been made, when testing the effect of hydrostatic pressure with strips of film immediately above one another, but in vertical planes alternately at right angles, and under these conditions it appeared that each strip showed the effect approximately independently of its position, and in a degree varying only with its length. Somewhat later tests in which the strips were in

the same vertical plane, but separated by intervals of one picture height (¾ inch) or more, gave the same result; and the two sets of facts were then incompletely and, therefore, inaccurately described together in one sentence.

In your comment on this, in the second paragraph in column II., on page 107, you remark that "one would naturally have expected that the exhausted stream from one strip would have affected the rate of bleaching on the next strip." Further tests, using strips of cinematograph film with identical developed images—a "stationary movie"—and ferricyanide-iodide bleach as before, show beyond doubt that two strips carefully arranged immediately above each other in the same vertical plane bleach *as one*. Nevertheless, with an interval equal to the height of one picture, the original observation of approximate independence of effect is confirmed; and, what is somewhat surprising, the interval may be reduced to 5 millimetres with no marked difference in the result, although the vertical convection current can be seen rising without perceptible deviation and striking the lower edge of the upper film. A still further reduction of the interval gives effects *intermediate* between approximate independence and an action as one unit. With a break of 5 millimetres or more, it may be surmised that the depleted concentration of iodide ion in the liquid of the upward current is largely restored by diffusion before the upper strip is reached, although the current still continues (under its own momentum).

The word "independently" should not in strictness have been used without qualification, for density measurements show that the action on the upper strip as a whole is (slightly) slower than that on the lower strip. Qualitatively, however, the effect is the same, namely, a continuous, but not uniform, diminution of density of residual silver on partially bleaching (and fixing) from the top to the bottom of each strip, the density changing faster near either end than near the centre.—Very truly yours,

E. R. Bullock.

Research Laboratory, Kodak Park, Rochester, April 14.

PORTRAITS AND THEATROGRAMS.

To the Editors.

Gentlemen,—With reference to your reports of recent lectures by Dr. Goodwin and Mr. Lambert, and the letter from Mrs. Maud Basil in your issue of the 21st inst., will you allow me to express a very hearty agreement with most of the contentions of the former gentlemen, more particularly with Dr. Goodwin's denunciation of what he justly called "adulterated portraiture," of which, with its "fancy lighting, stagey posing, and loud backgrounds," we are seeing a good deal too much of late! Further, though without any intention of being ungallant to a clever lady, much of whose work I have often admired, may I say that her letter does not appear to do much to disprove the opinions of Dr. Goodwin, while, at the same time, she contradicts herself by saying in one place that "portraits and theatrograms are not the same thing," and in another that the "best portraits are also theatrograms," two statements which the mere male mind is not able to reconcile.

I am especially moved just now to support both Dr. Goodwin and Mr. Lambert because I have recently become aware of a certain propaganda to popularise what is known as "spot lighting," with all its accompanying eccentricities and unnatural vagaries, ostensibly with the idea of creating a fresh vogue and of stimulating public interest in the at present rather moribund business of portrait photography. This it might possibly do, but only among unthinking and inartistic people, and only then for a very short time, and the new fashion would soon go the same way that, as I am glad to observe, the so-called "sketch" work is going, and that is out of favour among the better class of clients. Besides, just anybody would quickly learn to "play about" with a spot light, just as everybody quickly learned to do "sketch" work, whereas what every photographer should do to improve his business is to try to produce something absolutely personal, and which cannot be got just "round the corner."

The way to do this is to study Nature and human nature, and the powers and limitations of the process; and to do this from the solidly sane, natural, and serious standpoint, as was done by the new "old-fashioned" (from the modern art student's point of view) Old Masters, and by such photographers as D. O. Hill at the one end and Furley Lewis at the other of photographic practice.

Their plain, simple methods of posing and lighting would, I think, do more to "emphasise the personality of the sitter," which Mrs. Basil rightly regards as of so much importance, and, incidentally, to improve business among educated and worth-while clients, than any amount of "spot lighting" and other theatrical devices, in which the art (or artfulness) is not of the type "eclare artem."—I am, Yours faithfully,

Drinkwater Butt, F.R.P.S.

2, Margravine Studios, Baron's Court, W.6.
April 22.

SYSTEM IN HALF-TONE OPERATING.

To the Editors.

Gentlemen,—In reply to Messrs. W. J. Smith and E. L. Turner I am afraid that they have misread the passage referring to the change of stops. What I said was that the screen distances advocated by them would not produce satisfactory negatives with the same stop and exposure with different screen rulings. This is strictly true when one stop only is used for the exposure, and is the basis of my argument.

If at Bolt Court they teach a system based upon the use of more than one stop then it may be possible to use the same stops with different rulings, but the proportion of exposure with each stop of the series will vary with each ruling, which is much the same thing in principle, and makes exposure a variable when it should be a constant.

With regard to the so-called "pin-hole theory," it was perhaps not quite the best term to use, but it is one which I have heard so frequently when discussing some of these problems with operators that it came naturally. What I had chiefly in mind were the writings of some of the early investigators, such as U. Ray, Max Levy, and others in "The Process Year Book" in the late eighteen hundreds, about the time that the normal distance equation was evolved, and particularly an article by U. Ray in 1898, page 37, where he showed diagrammatically that the enlargement of a stop would actually decrease the nucleus of the dot from the fact that the screen focus had been upset. Many operators to-day believe in focussing the screen for each change of extension and stop.

Personally I do not agree with U. Ray's conclusions, and I only introduced the subject to try and arouse discussion. I see no reason why the stop should not vary from the usual equation if it is varied with a definite object in view. What I find fault with is the use of several stops in the making of a negative, when, in my opinion, a single stop will do the work as well, or better.

I am pleased to see that Mr. Hislop has written on the subject, and that he is in practical agreement with me on most points. He has fallen into the same error as Messrs. Smith and Turner with regard to the change of stop. My remarks about the necessity of using *f*/64 with a 200-line screen to obtain the same effect as *f*/32 with a 50-line screen were intended as an illustration of what undoubtedly is necessary when one stop only is used. The same gradation can be obtained with the same stop and exposure with both screens, but not with the screen distances as advocated by them.

I am satisfied that diffraction is the deciding factor in locating screen distances by calculation, and although I agree with Mr. Hislop that every screen has its own individuality, when the diffraction fringe has been measured and allowed for in the calculation the screen distance so found is so near that very little final adjustment is necessary. My investigations are not yet completed, but I shall probably publish some diffraction photographs shortly to prove my contentions, and then Mr. Hislop will, I hope, agree that no very great accuracy is needed to be able to measure the phenomenon and profit by it in every-day practice. As far as I have gone at the moment I can state the following:—

1. That the diffraction is strictly in proportion to the screen ruling.

2. That the diffraction is in inverse proportion to the diameter of the stop.

There, for the present, I would like to let the matter rest until I hear if anyone else has anything to say about it, especially as I purposely raised several controversial points in my article.

E. A. Bierman, F.R.P.S.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 3-cent International Coupon, from readers abroad

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

J. V.—We suppose you refer to film title negatives. You can get these from Mr. A. W. Bowen, 26, Dartmouth Park Road, London, N.W.

J. A. F.—Plaster busts to serve as models for studies in lighting may be bought from Messrs. D. Brucciani and Co., 254, Goswell Road, London, E.C.1.

H. and D.—The collected researches of Hurter and Driffield, edited by Mr. W. B. Ferguson, are published by the Royal Photographic Society, 35, Russell Square, London, W.C.1.

L. E. T.—The Society of Radiographers has its headquarters at the Electrical Department, Cancer Hospital, Fulham Road, London, S.W.6. Particulars from the Secretary, Mr. George F. Westlake, at this address.

T. F. E.—Two firms of printers of stylish letter headings suitable for use by photographic studios are Messrs. Hood, Ltd., Sanbride Works, Middlesbrough, and Messrs. Walter Pearce and Co., St. George's Press, Brentford.

F. M. C.—From the greenish tint of the image in the negative we should say that it has been developed with pyro-metol, formula for which you will find in the "Almanac," and in the instructions issued for their plates by the Imperial Dry Plate Co.

INVENTION.—If you know the name of the patentee, you can find any given specification of his which has been published by reference to the annual indexes of patentees which are kept in the Library of the Patent Office, 25, Southampton Buildings, London, W.C.2.

T. F.—The address of the Registrar of Business Names is now 4, Clement's Inn, London, W.C.2. Form for registration of your business is obtainable from him. As you do not trade under your own name, you are required by the Business Names Act to register. The Act applies both to British subjects and to aliens.

C. C. E.—There is no really satisfactory method of reducing the depth of sulphide-toned prints which are too dark. Most sulphide-toned prints become lighter on immersion in a weak solution of potass cyanide, but the action is somewhat erratic, and this treatment is pretty certain to affect both the colour and the gradation of the print prejudicially.

R. E.—There is nothing in the fact of enlargement by daylight to account for the failure in subsequent sulphide toning. We think the cause is to be sought in the method of development. Possibly your daylight exposure received less development, and so caused an inferior result in the sulphide toner, although not showing perceptible inferiority as a black-and-white print.

EURYSCOPE.—We are quite sure you will regret going to the expense of fitting a heavy rear extension to your light model half-plate camera. The latter is not strong enough for the purpose. Far better buy an old pattern square bellows camera of sufficient extension. You can get cameras of this kind second-hand at prices which probably will be less than the amount which your suggested extension will cost you.

Q. Q.—Trade lantern-slide colourists chiefly use oil colours. The technique of using oil colours requires some practice, especially as regards getting an even tint in skies and similar parts. If you write to Messrs. Winsor and Newton, 37-38, Rathbone Place, London, W.1, they will send you a reprint of an article which we published last year, giving very good working instructions in the use of oil colours for lantern slides.

J. B. A.—There is nothing in the particulars which you give of your manipulation of P.O.P., bromide and self-toning papers to account for the fading. The manipulation is quite correct, and shows you to be exercising more care in the operations than is often given. If you were to send a few unmounted specimens of prints which have faded, we could perhaps give some indication of the cause, although it is by no means easy to do so.

T. B. M.—No, it is scarcely correct to say that the depth of focus of one 6-inch *f* 6 lens is exactly the same as that given by any other lens of the same focal length and relative aperture. Such would be so only if all lenses were identical as regards the flatness of field. But since the field of sharp definition given by some lenses is distinctly curved, subjects may frequently be encountered with which this defect is a substantial advantage as regards getting near and distant objects in focus with a comparatively large aperture.

21—X.—We are afraid you are letting yourself in for a much longer job than you realise. Of late years there have been hosts of patents for cinematograph shutters, in many of which avoidance of flicker is claimed as a feature. The only thing you can do is to look through these specifications in the Library of the Patent Office, 25, Southampton Buildings, London, W.C.2. The classified abridgments of specifications, published by the Patent Office, will give you a pretty reliable key to the numbers of specifications to be examined.

F. J. C.—Sulphide toning is a very satisfactory method of making sepia-toned lantern slides, provided the black-developed slides tone readily. Some brands of lantern plate yield slides which tone most satisfactorily by this method, while others that we have met with bleach out, but do not come up fully again in the sulphide solution. The process gives slides of great transparency in the shadows. In this respect it is inferior to the results obtained by copper toning, although the latter is a process which works without exception on any make of lantern plate.

H. J.—The "B.J." pyro-soda developer can be used as a tank developer, although as it is a rather slow-acting formula, it is, we think, not altogether the best for tank work, and we would just as soon use a formula of the ordinary type, especially where the developer will be thrown away after it has been used for a batch of plates. It is usually advisable to employ a 5 per cent. sulphite solution for dilution of the developer in place of, say, half the water, when diluting an ordinary formula for use in a tank, but the "B.J." formula is so free from stain that if you do use it we do not think extra sulphite is necessary. The only time and temperature tables which have been published are those contained in an article in our issue of July 9, 1915, p. 445, in which dilutions and times were given in accordance with the Watkins' classification of plates as regards speed of development. We think you could develop a second batch, although in these circumstances you could not expect to repeat a given time of development at a given temperature. As good a formula for the acid fixing bath as any that we know is the ordinary 5 ozs. hypo in 20 ozs. water, with the addition of about ½ oz. of potass meta-bisulphite.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3235. Vol. LXIX. FRIDAY, MAY 5, 1922. Price Fourpence.

Contents.

SUMMARY.

In the second of the series of chapters on the business side of professional photography, "Pelham Swinton" has many shrewd observations to make on the relation of the photographer to his customer, and inquires particularly into the average customer's state of mind regarding the artistic quality of portrait photographs. (P. 263.)

A contributor to one of the electrical journals expresses the opinion that photographers are justly entitled to the power rate for current used for studio lamps, etc. (P. 266.)

The thirty-guinea cup offered by Mr. Arthur Brookes for the best exhibit of American portraiture at the Photographic Fair has been awarded by Mr. William Crooke to Mr. F. A. Free, of Davenport, Iowa. (P. 267.)

To sue a customer for the cost of a sitting, the results from which fail to satisfy, not only raises a legal issue of much doubt, but involves the risk of a very bad advertisement for the photographer. (P. 261.)

In a leading article we review some of the practical methods which can be adopted in making presentable enlargements from negatives which may suffer from excessive hardness and from coarse-grained originals, even prints from half tone blocks. (P. 262.)

A committee has been appointed under the Safeguarding of Industries Act to hear "complaints" regarding the sale of optical and other instruments manufactured in Germany. The committee will hold its first sitting on Monday, May 15. (P. 270.)

The third Hurter and Driffield memorial lecture will be delivered next week by Professor Svedberg. This meeting will be held at the Royal Society of Arts, and will begin at 8 o'clock. (P. 267.)

Photography with a hand camera is now permitted in the Royal parks without a permit. (P. 269.)

Processes for obtaining distinctive effects by transfer of a development print are described in a recent patent specification. (P. 266.)

A mixture of two desensitising dyes has been worked out by Dr. König, and is said to be free from the defects of phenosafranine while equally efficient as a desensitiser. (P. 262.)

"COLOUR PHOTOGRAPHY" SUPPLEMENT.

In an article on some causes of failure in Autochrome work, Mr. R. M. Fanstone emphasises the importance of bright lighting at the time of making the exposure, and also of several details in the development and after-treatment of the plates. (P. 17.)

The conclusion of the illustrated chronology of the Photochromoscope, by E. J. Wall, will be found on page 18.

M. A. Keller-Dorian has patented the use of a reflector in the refraction colour screen-plate process. (P. 20.)

A new edition of Dr. Lindsay Johnson's "Photography in Colours" is announced. (P. 20.)

EX CATHEDRA.

The Unsatisfied Sitter.

We are sometimes asked whether a customer can legally claim the return of any money paid at the time of the sitting, if he, or she, is not satisfied with the proofs and cannot, or will not, give another sitting. Any dispute of this kind, if taken into a County Court, would turn upon the particular circumstances of the case and also, very largely, upon the personal opinion of the judge on the point of whether the photograph was, or was not, a satisfactory likeness. We would never for an instant recommend a photographer to be led into such proceedings as these. Legally the issue is doubtful in the highest degree; it would serve just as useful a purpose to agree with the sitter to decide the dispute by tossing a halfpenny. But apart from this it is a very poor policy to confess an inability to do what the customer wants. If his, or her, requirements appear to be unreasonable, and if there is a flat refusal to visit the studio for another sitting, by far the best course is to return the money with regret that an opportunity is not available for making further negatives. The customer must then be left with the impression that the photographer is, at least, a fair and obliging person, and if she is no more fortunate elsewhere may return to him in the end. In the alternative the result may be that reported County Court proceedings may advertise the photographer as both inefficient and unreasonable.

* * *

The Sitter's Permission.

As a correspondent points out in references to our paragraph of last week on "Speculative Portraits," a photographer is not within his legal right in commissioning the making of an enlargement in colours from the negative which he has taken of a sitter nor in showing the enlargement in his window. Nevertheless, we do not think that the legal disability need deter anyone from acting upon the suggestion which we made. For, as a matter of fact, it is surely generally recognised that this right of the sitter is very seldom exercised, and is more honoured in the breach than in the observance. In ninety-nine cases out of a hundred a sitter has no objection to her portrait being shown in a photographer's window, but, on the contrary, is secretly flattered by its selection for this purpose. Occasions may arise in transactions with normal people when the request is made for a portrait to be removed from exhibition in this way, and to that request, of course, a photographer has no option but to comply. Therefore, despite our correspondent's objection, we think that opposition to the showing of a more elaborate or ornate portrait than that which the sitter ordered is likely to be very seldom made. The photographer's choice of a subject will indeed be taken as a special compliment, and will smooth the way for sale of the enlarged portrait to Mrs. A, or of others like it to Mrs. B, C, or D.

Pinakryptol Desensitiser. In an article which appears in the current issue of "Photographische Rundschau," Dr. E. König, of the Hoechst firm of Meister, Lucius and Brüning, has an article which gives a general outline of further experiments which he has been making on dyes which act as desensitisers of photographic emulsions. Dr. König was associated with Dr. Lüppo-Cramer in the latter's work on this subject, and has now completed a lengthy series of experiments which, it is stated, have led to a desensitiser fully equal in its effects to phenosafranine, but without some of the drawbacks of this latter. The name "Pinakryptol" is applied to this preparation, which is a mixture of two desensitising substances, forming a greenish-grey powder. It is used in the same dilution as phenosafranine, namely, 1 part in 5,000 parts of water, and has the advantage of being free from any staining action on fingers or nails or the gelatine or celluloid of photographic materials. Dr. König expresses himself satisfied that the advantages of the new preparation are such that it will immediately displace phenosafranine as a desensitiser.

SOFTENING ENLARGEMENTS.

THERE are many negatives which, from a variety of causes, are incapable of yielding good results if enlarged from in a straightforward way which would answer well with a good negative, and it may be well at the outset to define clearly between the two main classes which necessitate softening methods. In one may be placed those negatives which although satisfactory in other respects are very harsh in their contrasts, leaving the operator to choose between "soot and whitewash," the result of a normal exposure or the poor rusty colour which comes from the long exposure necessary to penetrate the high-lights. In the other class may be placed those which by reason of great enlargement from a granular image, or by being copied from bad originals, need the grain to be rendered less obtrusive than it would be in a "straight" print. In a few cases both these conditions may be present in one subject.

The methods to be adopted to remedy these defects vary considerably in their character, and cannot be appropriated entirely to either class of negative, several being of all-round efficacy. The most obvious course in dealing with a negative whose only fault is harshness is to use a paper with a long scale of tones, that is to say, one which will allow detail in the lights to be developed out without burying shadow details, at the same time preserving a good colour. Such papers are usually listed as "soft," and contrary to what might be imagined are not always rapid in working. Many of the newer brands, designed primarily for giving warm tones, are excellent for the purpose. It must be borne in mind that a strong illuminant is necessary with such papers, as a weak one, such as an oil light, would not penetrate the most opaque parts with any length of exposure, especially if the negative were at all yellow in colour.

Another method of reducing contrast is by breaking up the image into more or less distinct dots by means of a lined screen. This method was originated some years ago by Mr. Howard Farmer, who used a photographic copy of a cross-lined process screen. This was placed in contact with the bromide paper during exposure, which was five or six times as long as would be necessary with a normal negative. The action of the screen was to introduce a certain amount of white into the deepest shadows, thereby lightening them; although the same amount of white was present throughout the whole subject it was less apparent in the lighter parts. From considerable experience with such a screen, we are able to assert that the results so obtained are remarkably good. The only weak point about this method is that the necessary screens cannot be produced at a sufficiently low price to render them available for general use.

Failing such a screen, a piece of fine bolting silk, stretched upon a sheet of clear glass, forms a substitute which is by no means to be despised. This acts in the same way, but not quite to the same extent. If the bolting silk is in contact with the paper the grain is sharply defined, while, if the glass side is in contact, the grain is softened and the reduction of contrast is rather less. If the entire screen is removed farther from the paper, a somewhat different action is set up. Instead of breaking up the image, a diffusing action which scatters some of the light over the shadows is produced, the general definition being affected.

Coming to the other class of negatives, in which the granularity of the image is the trouble, the foregoing expedients may be used, or others less expensive may be adopted. A small lined screen fitted as a cap to the enlarging lens gives an agreeable amount of softening, enough to obliterate small freckles, retouching marks, scratches and similar defects, as well as reducing the coarse texture of copy negatives. With this, the degree of diffusion varies with the size of the grain of the screen, a fine screen giving the maximum of diffusion. In this position the action of the screen is quite different, the softening effect being due to diffraction. Instead of the lined screen, many workers use a piece of fine silk chiffon, which is stretched tightly over the lens and secured with a rubber band. Two or more thicknesses may be used if greater diffusion be desired. When using the cap-screen or chiffon, the image should first be focussed before screening the lens. The increase of exposure necessary is slight, compared with the screen in contact with the paper, from twenty to one hundred per cent. being the usual limits.

Various optical methods for reducing granularity have been proposed, and in some cases are satisfactory. When using a flat field lens, the image may be put slightly out of focus or, what is better, a lens with a soft focus adjustment, such as exists in the Dallmeyer, Cooke, and Aldis lenses, may be used. This, however, cannot be done to any great extent, as the halo thus produced spreads *inwards* round the shadows, and the effect is far from pleasing. An ordinary single landscape lens used at an aperture of about *f*/8 may be used as the enlarging objective with good effect; in fact, such lenses were used in the old days to subdue the brush markings on hand-painted lantern slides, before photography was generally utilised for lantern slide making.

As an example of a difficult problem in softening the image the following may be interesting. A 15 × 12 enlargement had to be made from a one-inch head, the only available original being a coarse half-tone print cut from a daily paper. This was copied, full size, in the ordinary way. The image was projected by means of a Cooke lens and focussed so that the edges of the screen image were slightly softened. The Farmer grader was placed in contact with the paper and the exposure made with the result that the image appeared like a fine-grained process block, the large grain being so broken up as to be practically invisible. When finished, there was no trace of the origin of the picture. It is seldom that such a problem presents itself, but there are many lesser ones, such as the practical worker encounters every day, when the adoption of one of the hints we have given will reduce the labour of finishing by fifty to seventy-five per cent., besides greatly reducing the risk of losing the likeness.

THE BUSINESS SIDE OF PROFESSIONAL PHOTOGRAPHY.

[In this second of a series of papers by a professional photographer of note, the author, writing over a *nom de plume*, examines with much insight and a good deal of humour the relation in which a photographer peculiarly stands towards his client or customer. He is under no illusions as to the appreciation of "art" by the public, and his healthy cynicism in this respect, however unpalatable to those who interpret generous patronage as a kind of certificate that their works are "art," may be recommended as sound guidance in the business of selling portraits to people whose standard of art is something very different from that of an artist's.]

II. THE PHOTOGRAPHER AND HIS CLIENT.

I have used the word "client" with diffidence owing to the fact that, in a recent court case, the judge is said to have registered his objection to the use of the term by other than professional gentlemen; and it has not yet been definitely decided whether we are really professional gentlemen or merely commercial persons with no hope of heaven at all. It will be remembered that a test-case arose during the war, when a well-known photographer applied for exemption from payment of excess-profits duty on the ground that he was a professional man. The court, however, made the startling discovery that the applicant was not a man, but a limited company, and the case was dismissed. The inference which we may draw from this decision, therefore, is, that when a man wishes to limit himself, and goes through the somewhat expensive ceremony of registering his name at Somerset House, he surrenders all claim to individuality, and that, logically, he should, like the professional cricketer, forfeit his right to be a Christian, and be known only by his last name.

Yet, how can a man enter the hereafter as a limited company? These intricate metaphysical questions are a source of considerable worry to the professional photographer, and it is a pity that the legal intellect has not favoured the world with an opinion on the subject—if a hereafter is recognised by a court of law.

To descend, however, to the practical, the photographer's client, or customer, is—or should be—his first object of study. A man may possess a deep insight into chemistry, understand all knowledge and all mysteries concerning optics, and have sufficient Art so that he could remove mountains, yet if he understand not his customer he is as sounding brass or a tinkling cymbal, and his balance-sheet will show a deficit at the end of the year.

This understanding of his customer is one of the factors of his business which has been most consistently neglected by the professional photographer. The grocer and the draper have brought this subject to the level of a science; yet the photographer has contented himself with immersion in such things as Art, the latent image, and the anastigmatic lens. Art is the prerogative of the academician and the amateur, while the other subjects are surely the concern of the apparatus and material manufacturers. The business of the professional photographer is to produce photographs for the public, and to discover what kind of photographs is best calculated to please the majority of those people with whom he wishes to deal. He should, therefore, cease his endeavour to study other people's businesses, and turn his attention to the direction of his own. It is, fortunately, a much more simple undertaking. It is not suggested that he should be entirely ignorant of such matters; but it is suggested that this aspect of professional photography is pre-eminently the most important.

Many photographers fail to realise that they are in business primarily for the purpose of making a living, and that this can be done only by selling their product to the people who pass by. These people in the street may be good citizens—and even Christians—but they will certainly not stop on their way to drop a guinea or two into the photographer's cash-drawer merely because the poor but honest gentleman is under the necessity, like the rest of the world, of paying his tradesmen's bills. They know quite well that the photographer must live—but so also must they; and if the photographer in question has an old-fashioned show-case and insanitary specimens, they presume that he is doing well enough, and that he has no need to bestir himself like other people. Certainly there is nothing in his specimen display calculated to induce anyone to patronise him for other than charitable reasons.

Meanwhile, our photographer sits in his studio, hating the people who pass by, and wondering why they do it. "Things weren't like this in the old days," he says. Those were the days, probably, when his specimens were new. "The public doesn't seem to appreciate good work as they used to do," he concludes. And he drowns his sorrows in the problems of diffused focus.

If the photographer wishes to earn a livelihood, he must, by means of his show-cases and other forms of advertising, create the desire for possession in the minds of the passers-by. It has already been pointed out that a photograph is a luxury. Except in a time of war, there is absolutely no necessity for anyone to be photographed. A woman will go out of her way to buy bread because she needs it in order to live; but she will not think of having a photograph taken unless she sees one which is displayed in a manner sufficiently attractive to create in her mind first the suggestion and then the desire.

But here we come to the next point. Suppose that the photographer's show-cases are clean, his specimens new, and his doorway not unattractive. He has arranged his display with care; and he bethinks himself fondly of the fine compositions, the correct tone-values, and all the subtle lightings, exemplified in the various prints. Yet his specimens still remain unadmired by the passing crowd. What can he do now? Surely here is proof of the public apathy toward Art! It is. And it is also convincing proof of the photographer's lack of appreciation of the public. He has thought of nothing but his lighting and his composition, and has forgotten entirely the fact that his object is to sell his portraits to the people outside, and not to himself. He is fully aware of the qualities which he admires in a photograph, but he has never exercised his imagination to discover what the public may prefer. This lethargic attitude is based on the fallacy that the general public is artistic. It is not. It is only necessary to look at the things which it hangs on the walls of its homes to realise this fact in its most awful form. And the shocking truth of the whole matter is that these people rarely notice lighting, do not care twopence for composition, and have not the slightest idea what tone-values are.

This lack of appreciation of the fact that the public may hold a different opinion as to the merits of a photograph is the chief cause of non-success in a photographic business. I do not suggest that the public is right in its opinions; on the contrary, it is nearly always wrong from the aesthetic or artistic point of view. But here is the crux of the matter. The man or woman purchasing a photograph does not want Art. What he or she desires primarily is likeness. So long as the Art does not interfere with the likeness, no objection will be made, and the photographer may amuse himself in this way if he care; but when the pictorial properties of the photograph commence to subordinate the likeness, then friction

arises. The reason of this is obvious. When people wish to decorate their rooms they buy oils, water-colours, or etchings. In their choice of these they may allow free play to their personal taste; or, if they are wise, they purchase works by only expensive artists, and their taste is established beyond doubt. But when the same people require a photograph it is rarely for decorative purposes, but usually in order to record the likeness of someone at a particular age, or in a particular dress. Hence the æsthetic in a photograph is not sought for, and is, at best, of purely secondary consideration.

It may be taken that only about one person out of every five hundred customers of a normal high-class studio will object to a photograph being poor in quality, or badly composed; while only one individual out of five thousand who patronise such a studio will so much as understand a portrait in an oil process. Thus, if a photographer sets out to do only that kind of work which is most pleasing to his own taste, and that taste is a high one, he will require a potential *clientele* as large as London in order to live comfortably.

Yet, in spite of all these facts, it is found that when a photographer has his portraiture praised by a customer he says to himself: "That client, at any rate, appreciates my artistic endeavour." And he looks with pride upon the long scale of gradation, the transparent shadows, and the sparkling high-lights (complete as advertised by the material manufacturers). He would feel somewhat pained, however, if he could know what that customer really admires in the photograph. If it is not merely the likeness which has evoked the expression of pleasure, it will be the effect of some hard outline or insufficiency of half-tone which has unwittingly crept into the picture, and of which the photographer is secretly ashamed.

When, on the other hand, a client violently condemns a portrait—apart from the likeness—it is because he has stumbled upon the results of the "artistic endeavour" just mentioned, and objects to it very strongly. Then the photographer says to himself: "This person has evidently no appreciation of tone or quality or composition. How can I make him see what I see, so that he may realise all that I have put into this portrait?" And he concludes: "I must educate him"—forgetting the millions of pounds spent on education by the Government every year with so little result.

In order to gain fuller experience in the business side of photography, I spent some time acting as receptionist for my own firm. A male receptionist is an unusual thing, but the public did not seem to show surprise. During part of my tenure of this important office there hung in the reception room, in a prominent place, a picture of which we were rather proud. It was an oil print, one of the best we had produced, and in its year had been hung in the Royal Society's exhibition. It had occasioned some notice at the time, and had been described by the art critics as "a noble work in oil."

None of our customers, however, seemed to pay any attention to this picture; and I commenced to wonder why "a noble work in oil" should cause so little comment. One day, however, I learned the reason. A lady, while waiting for her son to arrange an appointment, caught sight of this masterpiece, and, raising her lorgnettes, she exclaimed to the young man: "Or, *do* come heah! Isn't this keoice! So doke." Which is to say, being interpreted, "Isn't this curious! So dark!"

They examined the portrait for a moment, and then went their way. For all its art and its nobility, to the passer-by it was but a freak—obviously a photograph which had been left too long in the sun, and had become badly over-printed. I thought of the puny opinions of the art critics, and bowed my head in silence before the verdict of the great British Public, by whom we eat, drink, and have our being. This portrait is now removed to a quiet corner, and a large vignette hangs in its place.

Conversely, photographs at the opposite end of the æsthetic scale I have found to be praised rapturously. Especially is this the case with studio photographs emanating from Australia. A few of these have percolated into our studio from time to time for the purpose of being framed, and invariably we have been told how beautifully Australian photographs "come out." "They are so clear," it is pointed out. "Of course, it is the atmosphere there, you know. *So* different from our own climate."

As far as one can judge from these examples, the secret of the Australian portrait is embodied in the fact that it is simply three times harder than anything anyone has dared to produce in this conservative country, and that the retouching is performed with an even greater obliviousness to anatomy than the wildest dreams of the Society photographer. And the public is delighted. Nevertheless, it will be noted, the poor Australian photographer receives no credit for his cleverness. It is the atmosphere.

Thus we may conclude that if the photographer wishes earnestly to do business, and not merely to conduct an expensive and cultured type of hobby, he must not only have an attractive means of displaying his work, but he must show that kind of work most pleasing to his class of customer. Let him forget about art, and the latent image, and the anastigmatic lens, and turn all his energies in the direction of creating desire for his photographs in the minds of the public. Let him ask his wife, or someone who knows nothing of art, to give him a frank criticism of his specimens, and let him encourage her to point out those prints which she finds appeal to her most. Provided her mind is quite untrammelled by a knowledge of either composition or quality, she will select rightly, and her opinion may safely be taken as the opinion of the crowds who pass by.

People who have no immediate intention of being photographed look at a photographer's show-case for two reasons: Firstly, in order to see if there is a portrait of anyone whom they know, and, secondly, in order to see if there are any "pretty photographs." A "pretty photograph" involves, primarily, good looks; secondly, an attractive dress (such as in the case of a bride); and, thirdly, any unusual manner of posing which may be employed. It will be noted that neither quality nor composition is necessary. Lighting, if very unusual, may have an effect on the spectator, and this, in most cases, will be a subconscious one. A bride is probably the most attractive specimen which can be placed in any show-case. It may be relied upon to possess a magnetic range of twenty yards.

Thus, attractiveness in a specimen has little to do with the skill of the photographer, save in the case of posing. Even this depends largely upon the sitter, because if she have not an elegant figure it will be difficult to make much of the portrait, so far as a specimen is concerned. All that the photographer can do, having secured a well-dressed and handsome sitter, is to make the most of the opportunity. And this is no great task. Well-dressed and handsome women are rarely difficult subjects; yet, for every graceful curve of the body, and each beautiful line of the nose and mouth, the photographer will receive credit. People do not stop to think how much is photographer and how much is sitter in a photograph. On the other hand, no matter how great his triumph in producing a pleasing photograph of an awkward, nervous, and not too handsome subject, he will get credit only from the sitter and those who know her. Let him never, in the pride of the moment, attempt to use such as a specimen. Strangers would glance at it, say, "I don't think much of *that* photograph, anyway," and pass on. He must be prepared to accept all blame for the physiological deficiencies of his clients.

The far-seeing photographer, therefore, will fill his show-cases with a series of beauteous damsels—preferably of slightly theatrical appearance—gazing upward (or downward) with an expression of what is presumably fashionable languidness, but which strongly suggests indigestion. These—the other

to his doorway, and some up to his reception room. Here a further array of similar ladies must be on view, and not inferior in beauty, languidness, etc., to those downstairs. On the fresh wave of admiration which these arouse, the prospective client should be washed into the studio. But here a different attitude must be adopted. We return to grim realities, and likeness is once more the predominant factor. However greatly a client may admire languidness and double-lighting in the portrait of a stranger, she will not allow them to interfere with the rendering of a recognisable likeness of herself. The photographer need have little fear of complaint being made at the omission of such things in the portrait. As soon as the proofs reach the sitter all thought of these things vanish. The beautiful damsels are quite forgotten, and an entirely new interest is aroused.

There are, of course, cases where likeness is not desired, and idealisation is frankly demanded. But such portraits are usually for the purpose of publication in the press; and there is no reason why truth should be told in the half-tone reproductions any more than in the text.

Next in importance to an alluring display of specimens comes the name of the photographer or his firm. If his name, as generously given him by his godfathers and godmothers in his baptism, be William Smith or Harry Jones, let him conceal the fact like a murder. More skill and art are expected—and discovered—in the creations of a foreigner than of anyone unfortunate enough to be British. In practice, however, it is not necessary that the aspiring photographer should be of French or Italian birth. All that is required of him is that he should assume a French or Italian name. Many far-sighted photographers in this country have already done this, and, unfortunately, most of the best names have already been used up.

The psychological reason for all this is to create an "atmosphere." It is no more possible to conduct a successful photographic business without an "atmosphere" than to produce a play without scenery or costume. While the vast majority of the public do not recognise an artistic photograph when they see one, it must not be supposed that they will pay three, four, or five guineas for photographs which they do not believe to be "artistic." It must never be forgotten that when a picture of any kind appeals to a middle- or upper-class person, he or she calls it "artistic." It is psychologically impossible for such a human being to imagine that anything which delights his eye can be otherwise. Hence, although Art in its true sense is not desired in a photograph, the purchaser will always endow with artistic qualities any portrait which pleases him. It may be because the likeness is good; it may be because the print is hard and clean; or it may be because the dress or suit is depicted in unexpected detail. The photographer, on the other hand, may wish that the print had been softer, or that the dress had been lower in tone, and he dispatches the order with feelings of misgiving. He is surprised to learn, however, a few days later, that his customer is delighted.

This atmosphere of "Art" must be maintained in the reception room and in the studio. The customer expects it; and to jar his susceptibilities by any suggestion of the truth is fatal. To prove that this is no idle cynicism I shall give an actual instance. A young woman entered our reception-room and asked to see the different styles. I showed her the various sizes, and told her the price of each. Having selected the size which she preferred, I pointed out that this could be obtained either with a dark background or with a light one finished in the sketch style, and I asked her which she would like. She said: "O, now which is the *newest?*" (She did not say "newer.") "The sketch is the latest and most artistic, isn't it?" I replied that the sketch style was by no means *new;* that our own firm had produced it continuously for the previous twelve years; and I added, by way of explanation, that there was really nothing new in photography; that one must have either a sketch portrait or a solid one, and that there was no escape from these alternatives. She made an appointment for the following day, and went out. She never came back. Had I told her a direct lie, and said, "O, yes, madam, this sketch style is the very latest thing in portraiture, and the most artistic style as yet reached by photography," she would have been delighted, and I should not have lost a customer.

PELHAM SWINTON.

(To be continued.)

FORTHCOMING EXHIBITIONS.

April 21 to May 11.—Hammersmith Hampshire House Photographic Society. Particulars from the Hon. Exhibition Secretary, J. Ainger Hall, 2b, Bishop's Mansions, Bishop's Park Road, London, S.W.6.

April 22 to May 27.—Royal Photographic Society. Colonial prints arranged by "The Amateur Photographer and Photography." Open daily from 11 to 5 p.m. 35, Russell Square, London, W.C.1.

May 1 to 6.—Photographic Fair. Horticultural Hall, Westminster. Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1.

June 1 to 30.—Royal Photographic Society. Prints by Pirie MacDonald, of New York.

September 9 to October 7.—London Salon of Photography. Latest date for entries, August 30. Particulars from the Hon. Secretary, London Salon of Photography, 5a, Pall Mall East, London, S.W.1.

September 11 to 15.—Professional Photographers' Association, Princes Galleries, Piccadilly, London, W. (Trade and Professional). Hon. Secretary, Richard N. Speaight, 157, New Bond Street, London, W.1. Also foreign invitation loan exhibition of professional portraiture. Hon. Secretary, Marcus Adams, 43, Dover Street, London, W.1.

September 18 to October 28.—Royal Photographic Society Annual Exhibition. Latest date for entries, August 25 (carrier); August 26 (hand). Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, April 18 to 22.

APPARATUS.—No. 11,175. Apparatus for coating photographic, etc., films. H. Lichte.

NEGATIVES.—No. 11,130. Negative registering devices. Offset Directoplate Co.

CINEMATOGRAPHY.—No. 10,909. Moving-picture cameras. G. W. Bingham.

CINEMATOGRAPH-PHONOGRAPH.—No. 11,019. Machines for synchronously reproducing sounds and projecting pictures. G. Bohn.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

REFRACTION COLOUR SCREEN-PLATES.—No. 153,151 (January 21, 1920). The invention consists in apparatus for a process of colour photography, and includes the combination with a sensitive plate (having microscopic refracting surfaces) and a camera lens, of a reflecting device. The latter has inclined surfaces, placed

between the lens and the plate, for the purpose of producing interference.—Albert Keller-Dorian, Rue Daguerre, Mulhouse, Alsace, France. (Details of the invention are given on another page in the "Colour Photography" Supplement.)

TRANSFER PRINTING PROCESSES.—No. 177,255 (December 22, 1920). A photographic print, produced upon a stripping substratum giving a matt or nearly matt surface to the face of the film, is transfered with the matt surface uppermost, to a mount between which and the picture film is produced a gelatinous transparent substratum of a reflecting or shiny character, the transfer being effected in such a manner as to make optical contact between the film and the said reflecting substratum.

The substratum may be produced by the aid of a gelatine adhesive layer so prepared as to give a sheen showing through the transferred emulsion. The effect of this shiny under surface is to increase the reflection of light through the parts of the print which are not too dense, and especially through the parts which represent high-lights, with the result that the lighter parts of the print are thrown into much greater relief than is the case with ordinary photographs, while the dark portions or shadows are intensified. In the complete print there are three surfaces of reflection, the upper surface, where the reflection is reduced by the matt effect, the paper or other mount, and the surface of contact or union between the back of the transferred film and the underlayer, which reflecting surface lies between the first two. The increase of reflecting power at this intervening surface in accordance with the invention gives the enhanced effect sought.

A convenient method which may be adopted in carrying out the invention is to coat the paper, card or other material with a solution of gelatine, a suitable strength being about 2½ per cent. of gelatine dissolved in hot water, applying the solution rapidly to the mount over a sufficiently large area to take the print and as evenly as possible, leaving considerably more gelatine than is required to make the photograph adhere. The card or paper mount is preferably previously damped or soaked for about a minute, or until it becomes limp, in cold water, laid on a flat surface and the surplus water removed with a sponge, whereupon the gelatine is applied, and the print is also damped or soaked and has its surplus water sponged from it.

The print may be prepared with a stripping substratum in accordance with the specification of Patent No. 164,448 ("B.J.," July 29, 1921, p. 452), but the present process is not confined to any special type of transfer print excepting that when transferred it must have a matt or nearly matt surface and be of such a nature that the light can readily pass through the lighter parts and be reflected by the backing, to give the required effect. The preparation of the print by the aid of the stripping substratum comprising an emulsion hardening agent as claimed in the patent above referred to, especially chrome alum, is a method particularly useful in conjunction with the present method of dealing with the transferred print.

The damp print is then placed face down on the mount, upon the coating of gelatine, the print being lowered gently down from one edge on to the gelatine surface, any air bubbles and surplus gelatine being squeezed out in the process of laying down and the surplus gelatine removed with a gelatine brush or a sponge. The mount surrounding the print is then sponged with clean water to remove any traces of gelatine.

Drying is effected by placing the mounted print in a current of warm air so that it dries fairly quickly, when dry the original support of the film being pulled away from the mount, leaving the picture on the mount with a shiny layer of gelatine beneath the film. The excess gelatine which is put on the mount is to minimise the risk of air bubbles getting in between the film and the mount, and avoids the necessity for heavily squeezing the transferred film, the method adopted giving a very even layer of gelatine.

In cold weather the damp mount can be laid on a warm surface such as a folded piece of fabric quickly removed from a dish of hot water, or the wet fabric may be laid on a warm surface such as glass, this keeping the mount sufficiently warm to prevent the gelatine from setting before the transfer is complete. When the print has been laid down, the mount can be removed to a cold surface such as a sheet of cold glass, quickly chilling the gelatine and allowing of sponging the mount without shifting the print.

The actual method of mounting can, of course, be varied, and a very satisfactory method in cold weather is to lay the damp mounting paper or card upon a piece of glass a little smaller than the card and just removed from warm or hot water before applying the gelatine; a soft gelatine is preferably employed, which may be put on with a brush or poured on the mount from a spouted jug, the warm glass providing sufficient heat to prevent the gelatine setting before the print is in position; the surplus gelatine can be poured into a jar and the margins of mount sponged with clean water to remove the traces of gelatine, after which the mounted print is removed from the glass and dried. By this method no gelatine is likely to get on the back of the mount. The best temperature of gelatine solution and water for warming the mounting glasses or fabric depends on the atmospheric temperature, as also does the temperature of the gelatine solution for mounting, such temperatures being readily determined by a little experience, as all that is required is enough heat to keep the gelatine solution in a sufficiently liquid condition till the print is properly laid down on the mount. Any other method of mounting which produces the underlying shiny layer may, however, be employed in the process.

The strength of gelatine solution can also be varied; generally from 2½ per cent. to 5 per cent. will be satisfactory; the warmer the weather the stronger the solution. For wood, glass, and such like surfaces a 5 per cent. solution will generally be found satisfactory.

No added pressure is put upon the print after it is laid upon the mount, merely the weight of the wet print being utilised; squeegeeing would squeeze out some of the gelatine and spoil the effect.

Most ordinary photographs on paper or card show a gloss or sheen more or less over the whole surface; in the case of certain papers, however, it has been found possible to eliminate the gloss and produce a matt or nearly matt surface without a glossy effect, but the result of this is often a loss of brilliancy. On the other hand, engravings on vellum or a similar surface appear much more brilliant than ordinary photographic prints owing to the contrast produced between the uninked surface and the matt or nearly matt surface of the ink, by the sheen of the vellum. The present process obtains an effect by purely photographic means which approaches that of an engraving printed on vellum or a similar surface.

The photographic transfer print may be prepared in accordance with the method described in specification No. 164,448 already mentioned. The method employed must not impair the ability of the film to transmit light readily through the parts which are not in deep shadow.—Frank William Kent, 5, Thornton Avenue, Streatham Hill, London, S.W.

The following complete specifications are open to public inspection before acceptance :—

APPARATUS.—No. 178,127. Photographing-apparatus. J. Pecsi.

APPARATUS.—No. 178,128. Apparatus for use in joining together lengths of photographic or cinematographic film. Correxmuvek Filmipari Gepgyar C. Lazzlo.

APPARATUS.—No. 178,430. Apparatus for direct vision or for projection of separate transparent photographic views upon films or the like. H. de Ruyter.

CURRENT AT POWER RATE.—In the issue of April 21, "Electricity," "Elektron" refers to the question of rates for electric current for photographic work. He says: "As an impartial observer I should say they (photographers) are justly entitled to the power rate for current so used. Cinemas and theatres are supplied with projector current and current for other special services at power rate, and there is no justification for any compromise. It is in the best interests of the supply authorities to encourage the more widespread use of electrical energy, and not to militate against its use by these vexatious and irritating objections. After all, a power rate is justified because of the greater average demand per consumer, which helps the station load curve. If that greater average consumption is due to demand for current for feeding photographic arcs or projectors, it is no concern of the supply people. The greater demand exists and the lower charge is justified. What about the consumer who installs a motor-generator to light his premises, and pays for current at power rate? To my mind there is only one answer; if he cares to incur the initial expense, and go about his lighting in such an inefficient manner, he will require a greater current supply and is entitled to the privilege for which he is paying. His case is on a par with that of the cinemas."

New Books.

THE THEORY OF MODERN OPTICAL INSTRUMENTS.—A second edition of a translation of this treatise by Dr. Alexander Gleichen has been published by the Department of Scientific and Industrial Research, for whom it is issued by H.M. Stationery Office, Imperial House, Kingsway, London, W.C.2, post free 13s. 6d. In addition to making such corrections as escaped notice in the first edition, the translators have carried out further revisions chiefly by way of explanatory footnotes. While they have left the main text practically untouched, we are glad to see that they have done something towards correcting the historically inaccurate impression which the first edition conveyed as regards the origin of certain notable British lenses. We called attention to this defect when reviewing the first edition three years ago. In the present volume the chapter on the photographic objective is provided with a chronological appendix giving optical constants of a very large number of lenses, together with particulars of the date of their introduction or patenting. This compilation is certainly of great value to the student of photographic lens construction since it identifies the names by which notable objectives are known with the patent specifications relating to them. Nevertheless, it seems unfortunate that the very partial account given in the text of the commercial development of the telephoto lens could not have been amended.

New Materials.

Novex Plates. Made by Kosmos Photographics, Ltd., Letchworth.

SOONER or later a firm which has made its entrance into the photographic trade by the manufacture of printing papers extends its scope to the production of dry plates. The Kosmos Company, while one of the youngest of photo-material firms, has quickly come into the front rank through the excellence of its papers and from its enterprise in originating distinctive grades of printing paper. Not content with the large trade in its well-known bromide, Vitegas and Novex printing papers, it has recently extended its borders to the manufacture of dry plates, to which the trade name of "Novex" is also applied. Without the intention of taking liberties with the Latin vocabulary they have coined this word to be read as a purely English contraction of "no vexation," a name which has amply justified itself in the experience of users of the gaslight papers to which it was first applied.

We are quite sure from our experience that those who employ the plates for their negative making will confirm the extended use of this trade designation. Novex plates are made in four grades, namely, "Maximum Speed" (400 H. and D.); "Studio Orthochromatic" (400 H. and D.); "Extra Rapid" (350 H. and D.); and "Orthochromatic" (300 H. and D.). The two first of these are exceedingly rapid plates, the behaviour of which in the camera confirms the claim of the makers that the H. and D. marking is a genuine indication of speed. Employed with an ordinary pyro-soda developer the "Maximum Speed" yields any required degree of vigour combined with excellent gradation and with absence of any fogging or veiling. The "Studio Orthochromatic" seems to be a somewhat softer plate, admirably adapted to studio portraiture, particularly for short exposures by artificial light. Those who prefer a somewhat lesser degree of speed will find that the other two grades maintain an equally high standard in their photographic qualities and mechanical perfection. All four grades evidently represent the best modern skill of the maker of photographic emulsions, and will certainly take their place among the leading dry plates for which this country has been and is justly celebrated wherever photography is practised.

AMERICAN PORTRAITURE AT THE FAIR.—Mr. William Crooke, of Edinburgh, who has judged the exhibition of work by American professional photographers which is being shown during the present week at the Photographic Fair, has awarded the thirty-guinea cup offered by Mr. Arthur C. Brookes to Mr. F. A. Free, of 1,426, Brady Street, Davenport, Iowa.

New Apparatus.

The Apem Daylight Developing Roll Film Tank. Made by Amalgamated Photographic Manufacturers, Ltd., 3, Soho Square, London, W.1.

IT seems incredible on first looking into the inside of this tank that an apparatus so innocent of moving parts should provide the means of the transference in full daylight of the exposed band of film from its spool to the tank in a way to permit of its subsequent development. The only working mechanism, if such a description may be used, is a thin spindle placed across the width of the tank about two inches from one end. The spool of exposed film is placed within the space between this roller and the end of the tank, and the paper wrapping passed under the roller and then in a loop

back out of the tank after the lid has been put on. Then, as shown in the drawing, the wrapping has simply to be drawn completely away in order to leave the length of film extended in a bubble loop, uncoated side outwards, in the tank. This apparent feat of legerdemain is made possible by the provision of a length of fine metal webbing attached to the lid of the tank, the removal of the paper wrapping moving the film band in the opposite direction within the tank. A light-trapped inlet in the lid of the tank provides for the admission of developer and a screw cap outlet for removal of the latter and for washing the developed film before fixing, which latter operation may be done either in the tank itself or by removal of the film to an ordinary dish. The apparatus is very well made in nickelled metal, and is obtainable in five sizes for films from 2½ x 1¾ inches to 5½ x 3½ inches, at prices from 17s. to 37s. 6d. Developing powders for use with it are supplied at from 1s. to 2s. per box of six packets.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, MAY 8.

City of London and Cripplegate P.S. "Printing Dodges." G. C. Weston.
Southampton Camera Club. "Carbro." A. Dordan Pyke.
Wallasey A.P.S. Members' Review of Exhibition.

TUESDAY, MAY 9.

R.P.S. Third Hurter and Driffield Memorial Lecture. "The Interpretation of Light Sensitivity in Photography." Prof. Dr. The Svedberg. At the Royal Society of Arts, John Street, Adelphi, W.C.2, at 8.
Bournemouth C.C. Outing. Horse Shoe Common.
Cambridge Photo Club. "Photograms of the Year," originals.
Hackney Phot. Soc. "Amateur Photographer" Prize Slides.

WEDNESDAY, MAY 10.

Croydon Camera Club. Display of Outing Prints.
Dennistoun A.P.A. Demonstration for Beginners. Leading Up.
Hackney Phot. Soc. Outing to Whipp's Cross.
Photo-micrographic Soc. Annual General Meeting, [illegible].
Rochdale A.P.S. [illegible] Photography." J. C. W[illegible].

THURSDAY, MAY 11.

Hammersmith Hapsburg House P.S. "The Possibilities of a Small Camera." E. Homan.
Optical Society. Ordinary Meeting.

SATURDAY, MAY 13.

Dennistoun A.P.A. Outing—Castlemilk Estate.
Hackney Phot. Soc. Outing—Ayot to Wheathampstead.
Wallasey A.P.S. Outing. Burton and Puddington.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, May 2. Mr. Dudley Johnston in the chair.

A paper on "The Reproduction of Pictorial Work by Modern Methods" was read by Mr. E. L. Turner, who briefly outlined the technics of the half-tone process, rotary photogravure, and photo-litho offset. He explained that none of these processes was able to give a tonally facsimile reproduction of an original. In rotary photogravure there was marked deficiency in the rendering of the deepest shadow tones.

A lively discussion followed, chiefly on the fine etching in the half-tone process, the speakers including Messrs. A. J. Bull, E. A. Bierman, W. J. Cartwright, F. W. Jackson, A. J Banfield, F. T. Usher, and Maxwell Wilson. A hearty vote of thanks was accorded to Mr. Turner.

CROYDON CAMERA CLUB.

Mr. G. E. W. Herbert gave a highly interesting lantern lecture on the "Isle of Purbeck," consisting of a walk along the coast from Studholme to Lulworth Cove, with occasional trips inland. He claimed, for the length of the ground, it was without rival for varied picturesqueness, and certainly the pictures supported this contention.

Almost the entire route was photographed, the scenery in advance of the standpoints adopted, and often the country already traversed, looking backwards. This necessitated many slides—in fact, far too many. Mr. Herbert's stuff was really good, and it was a pity atrophy was induced by a surfeit.

At the conclusion of the lengthy lecture, further slides, unconnected with the subject, were thrown in as "makeweight." There was a subtle humour about this, appreciated by the members, who thus acquired a second wind. All the slides were from roll films, and their crystal-cut appearance was favourably commented on.

In the discussion, Mr. Harpur, whilst praising their general quality, felt that the lecturer "had not got much inspiration from the pictorial element, as was evidenced by a sneaking regard for avoiding anything pictorial." Only Mr. Harpur can phrase things like this, and one is enough. But he should have excepted not a few slides well up to exhibition standard. In reply to a hearty vote of thanks for an enjoyable evening, the lecturer mentioned the film negatives were stereos, demanding treatment not always in sympathy with art principles.

Next, "A Criticism of the Affiliation of Photographic Societies," by the Editor of "The Club Photographer," appearing in the April number, was considered. Though the Croydon Club is a loyal supporter of the Affiliation, all agreed that no objection could be raised to fair criticism, however adverse. But the particular method of criticising it adopted by the Editor of "The Club Photographer" was (to put it mildly) referred to in terms the reverse of complimentary by speaker after speaker. Finally, a formal protest was unanimously registered at "the regrettable and deplorable way in which the matter had been dealt with by him."

It should in fairness be also recorded that a firm conviction was expressed that the great majority of the famous Liverpool Society, whatever opinions they might have as to the value of the Affiliation, would resent being associated with the article in question.

SOUTH SUBURBAN PHOTOGRAPHIC SOCIETY.

The fourteenth annual meeting of this Society was held at the headquarters, Plough Hall, Lewisham, S.E., on 26th ult., when Mr. P. R. Salmon was re-elected president, and Mr. H. D. Fretwell (10, The Grove, Greenwich, S.E.), hon. sec. and treasurer. Although badly hit by the war, a most satisfactory year's working was reported; 25 new members joined during the past season, and there were 10 resignations, mainly removals from the district; the active membership is now 76, and the average weekly attendance 30. The expenses were a little in excess of the receipts, but the treasurer reported a balance at the bank of nearly £4. All were most optimistic, but some time must elapse before the club can get back to its pre-war membership roll of 120. The Society is one of the most curiously constituted in the photographic world, and an insuccessful attempt was made to place the Society upon an orthodox footing; older and, maybe, wiser minds prevailed, however, and the Society will continue upon the lines it started. The Society, in brief, is an offshoot or satellite of the South Suburban Camera Club, a body one hears or knows little about—one founded on strict business and legal lines, and registered under the Friendly Societies Act.

GLASGOW AND WEST OF SCOTLAND SOCIETY OF PROFESSIONAL PHOTOGRAPHERS.

The monthly meeting of the Society was held in the Religious Institution Rooms, Glasgow, on April 28, 1922, Mr. J. R. Brinkley, president, in the chair.

Interesting and instructive papers were read by the following gentlemen :—

Mr. J. Doig on "Panchromatic Plates and their Uses."

Mr. A. Fairbairn on "Business Methods in Photography," and

Mr. J. Douglas Ritchie on "Reminiscences and Experiences."

There was also exhibited to the meeting a very fine collection of prints by Mr. Herbert Lambert, of Bath.

It was decided to hold a photographic exhibition under the auspices of the Association in the autumn of this year, and the hope was expressed that not only the members but outsiders would participate in the exhibition.

Votes of thanks to the lecturers, Mr. Lambert and the Chairman terminated the meeting.

Commercial & Legal Intelligence.

LEGAL NOTICES.—At an extraordinary general meeting of the members of the Morland Studios, Ltd., held at 37, High Holborn, W.C.2, a resolution was passed to the effect that the company be wound up voluntarily, and that Mr. Richard George Brake, 33, Mulgrave Road, Neasden, Middlesex, be appointed liquidator. Creditors are required, on or before May 15, to send particulars of their debts or claims to the liquidator.

NEW COMPANIES.

PI-RA, LTD.—This private company was registered on April 21 with a capital of £3,000 in 2,450 ordinary "A" and 550 ordinary "B" shares of £1 each. Objects: To adopt an agreement with F. W. Cook, A. H. Phillips, J. A. Houlton, and J. Nevitt, trading as the Pi-Ra Photo. Co., at Terrace Gardens, St. Albans Road, Watford, for the acquisition of the freehold buildings, works and factory there, and the stock, plant, fixtures, etc., used by them in their business of photographic picture-postcard manufacturers. The subscribers (each with one "A" ordinary share) are: G. Stracey, 100, Mildred Avenue, Watford, director, and F. W. Cook, 23, Malden Road, Watford, chemist. The first directors are: F. W. Cook (managing director), J. Nevitt, and G. Stracey. Qualification: 100 "A" or "B" shares. Registered office: Pi-Ra Works, Terrace Gardens, St. Albans Road, Watford.

LESTY AND CO. (1922), LTD.—This private company was registered on April 24 with a capital of £1,000 in £1 shares. Objects: To carry on the business of lithographers, stereotypers, letterpress, music, photographic, intaglio and colour printers, printers' contractors, etc. The permanent directors are: A. G. Jackson, 92, Chancery Lane, W.C., stationer, etc., and E. H. Diprose, 9 and 10, Sheffield Street, Kingsway, W.C.2, printer.

THE NEW KOSMOS FACTORY.—Visitors to the exhibition of the Royal Academy this year will find in the Architectural room an exhibit, No. 1,228, of special interest to them. This is the drawing of the front elevation of the new factory which is in course of erection at Baldock by Messrs. Kosmos Photographics, Ltd. The architect, Mr. Thomas H. Burditt, a cousin of Mr. W. H. Burditt, of the Company, has adopted a beautiful design based on the Greek style, and embodying, so we are told, the results of recent investigation of Greek architecture, from which it is found that the frontal facade of an ancient Greek building is not a flat surface, but part of a sphere having a very great radius. Extraordinary pains have been taken in the case of the Kosmos factory to carry out this plan, with most successful results as regards the beauty and dignity of the building. The factory has been designed upon a very large scale, and provides for expansion of the Company's business without disturbing the scheme of the departments according to which material pursues a continuous course in process of manufacture.

News and Notes.

HOUGHTONS PROFESSIONAL BULLETIN in its latest issue has some interesting notes on American professional photographers and their studios by Mr. Reginald Haines, who visited the United States last year and attended the Convention of the Photographers' Association of America.

A SWISS NATIONAL PHOTOGRAPHIC EXHIBITION is to be held at Geneva in May next year. Wide support has been obtained for the exhibition, which will include within its scope both professional and amateur photography. Particulars are obtainable from M. P. Rudhardt, at 12, Boulevard du Theatre, Geneva.

PHOTOGRAPHIC BARGAINS is the title of the 52-page list of second-hand cameras of all descriptions, but chiefly the folding pocket instruments for film and plates issued by Messrs. Wallace Heaton, Ltd., 17-19, Change Alley, Sheffield. The list includes also particulars of a great number of lenses. It is sent on receipt of 2d for postage.

MESSRS. W. BUTCHER & SONS are issuing a series of complete outfits at prices from 18s. 6d. to 62s. 6d., including dishes, dark room lamp, measures and essential chemicals. A special leaflet and window bill drawing attention to the sales to be made of these goods in connection with the All British £3,000 competition are obtainable by dealers on application to Camera House, Farringdon Avenue, London, E.C.4.

THE WESTMINSTER PHOTOGRAPHIC EXCHANGE, 119, Victoria Street, London, S.W.1, sends us a 44-page list, about one-half of which is devoted to cameras and other accessories for the amateur photographer, representing the most recent introductions of photographic manufacturers, whilst the other half is a list of second-hand roll film, plate, focal-plane, reflex and other cameras. The list is obtainable free on application.

THE PHOTOGRAPHY OF GOLFING STROKES.—The golfing world is now very much interested in some slow-motion photographs of Harry Vardon's strokes, which are now being shown, and portions of which are being reproduced in the illustrated Press. The pictures, it is stated, were taken at the rate of 160-200 per second, instead of the normal rate of 16 a second, the projected rate (also 16 a second) allowing golfers to study the slowed-down movements carefully and comfortably.

PORTRAITS BY MR. HERBERT LAMBERT.—There is being shown in the foyer of the Covent Garden theatre, during the present season (May to July) of grand opera, a collection of photographic portraits by Mr. Herbert Lambert of modern British musical composers. The collection exhibits Mr. Lambert's art in its virility, for all of the portraits impress one as strong character studies of notable personalities. Lovers and students of music, of which Mr. Lambert himself is one, will obtain a few minutes' pleasure by stepping aside from the shabby thoroughfare of Bow Street and looking at these fine examples of his artistry.

PREPARATION OF COLLOIDAL SILVER.—Five gms. of albumen is dissolved in 25 c.c. of water by the aid of 0.75 gm. of sodium hydroxide and warming on a water bath. The solution is then filtered. Silver oxide prepared from 10 gms. of silver nitrate and washed by decantation is then mixed by stirring with the albumen solution, and the mixture diluted to 200 c.c. and warmed for an hour on the water-bath. After cooling, it is precipitated with acetic acid, and the precipitate washed with very dilute soda solution, then dried. The product contains 75 per cent. of silver.—*Journ. Soc. Phys. Chim., Russ.*, through *Amer. Drugg.*, February, 1922, 42.

SECRET PHOTOGRAPHY AT THE ZOO.—According to the daily papers the authorities of the London Zoo are very much concerned about some natural history pictures now being shown at the picture halls, and taken unmistakably at the Zoo, and inquiries are being made as to how these were obtained. Though it is thought possible that they may be reproductions from old films known to have been taken surreptitiously about two years ago, it is suspected that they are new ones taken recently with a portable apparatus fitted with a gyrometer to obviate the use of a handle. Reliable films of animal life in the Gardens have been taken by the official cinematographer, and these, it is understood, will be released for public exhibition so soon as the approval of the Council has been obtained.

HARDENED GELATINE IMAGES.—A patent specification (No. 175,988, of P. Schrott, 98, Hauptstrasse, Vienna), which is abridged and open to inspection under the International Convention, relates to a process for obtaining images consisting of hardened gelatine. To transform a silver image into a tanned gelatine image by hardening the gelatine in the presence of the image by a bichromate, the silver image is first treated in a bath, such as copper bromide or chloride or silver ferrocyanide, to obtain a compound metal image which acts as a reducing-agent to a bichromate, and the image is then treated in the bichromate bath. A yellow image is formed which is an indication that the tanning is complete. The metal image can be dissolved out by acid leaving a clear tanned gelatine image which can then be coloured by dyes, or a greasy printing colouring matter can be used and the image used as a phototype.

SHOPPING-WEEK PHOTOGRAPHS.—This week the Catford, Lee, and Lewisham traders are having a special shopping week, and photography is playing its part in the events of the week in these South-East London districts. We clip the following from the official programme, a copy of which was delivered at every house in the districts named:—A prize for photograph of the brightest smile during the week; also a prize for the smiler. A guinea for a smile. Whenever you see a camera during Shopping Week, smile; it may bring you a guinea. That prize will be given to the owner of the best smile found in the shopping area during Shopping Week. A guinea for the photographer who photographs the best smile. Never mind whether you know the owner or not. If you see a good smile, snap it. Send the print to, or hand the negative into, Leslie's (a local chemist and photographic dealer). The prints will be judged by the Catford Camera Club Committee.

PACKING CASES FOR AMERICA.—We all know that there is a tariff on almost all British goods entering the United States, but not everybody knows the far-reaching effects of these tariffs. A writer in the "Evening News" calls attention to a very curious state of affairs. "I have been hearing," he says, "a lot about packing cases. These, like their contents, are dutiable, it seems, and the amount to be paid depends on the amount of the tax upon their contents. For some things, therefore, the tax on the packing case is a very heavy item. But packing cases made of American wood go in duty free, with the result that a new industry is springing up in this country, the manufacture of packing cases from American wood specially imported for the purpose. One large exporting agent I met yesterday is circularising his clients, insisting on their sending their goods packed in cases of American wood. The extra cost involved is less than the amount of the duty."

PHOTOGRAPHY IN ROYAL PARKS.—The free use of hand cameras in Bushey, Green, Greenwich, Hyde, Regent's, Richmond, Hampton Court, Primrose Hill, and St. James' Parks has now been sanctioned by the Office of Works. This concession was announced in the House of Commons last week. Sir John Gilmour, as representing the First Commissioner of Works, said that permits would not in future be necessary for hand cameras in the unenclosed portions of the Royal parks, but as the unrestricted use of stands and cinematographic cameras might cause obstruction and lead to infringement of the general regulations on trading in the parks, the First Commissioner of Works did not see his way to modify the regulations in that respect. It is to be hoped (writes a correspondent) that park-keepers and others concerned have been made acquainted with the concession, as although the "Red Book" has for many years served as a permit, many keepers have been ignorant of it, and have caused a considerable amount of trouble.

REVERSAL PROCESS. According to a patent, No. 176,357, of Kodak, Ltd. (assignees of J. G. Capstaff, Rochester), under the International Convention, in a reversal process, more particularly for cinematograph film negatives, the second exposure to light, after removing the first image, is controlled in accordance with the characteristics of the remaining emulsion as to its tendency towards re-reversal, its printing value and its contrasts. Also, previously to the second development an alkali bath may be used. The steps of the complete process are (1) exposure, (2) development, (3) washing, (4) reversal, i.e., removal of the silver image, (5) washing, (6) clearing by a bisulphate bath, (7) rinsing, (8) ascertaining the characteristics above-mentioned, (9) treatment in an alkali bath, which may be optional, (10) rinsing, (11) exposure to controlled light, (12) developing, (13) rinsing, (14) fixing with acid hypo. Particular formulæ are included for steps (2), (4),

(9), and (12). To ascertain the exposure for step (11) a test strip of film is cut off, the pictures exposed to a standard light beneath a series of density filters, and developed. The alkali bath of step (9) is adopted if the test film shows a tendency to reversal when developed.

LONDON CHAMBER OF COMMERCE.—The 40th annual general meeting of the London Chamber of Commerce was held on Wednesday last at the Skinners' Hall, Dowgate Hill, E.C., Mr. Stanley Machin, J.P., in the chair. The report of the Council of the Chamber on the transactions of the past year referred to the Italian duty on photographic papers, and stated that in view of the cancellation of the commercial treaties between Italy and Austria-Hungary, with the consequent abolition of the conventional rate of duty on certain goods, including photographic paper, it had been suggested to the Board of Trade that efforts should be made to obtain from the Italian Government special tariff treatment for such British papers. The Board replied that the matter would receive their consideration, and that the observations of the Chamber had been carefully noted, in case it should be possible to raise the question with the Italian authorities. Passing on to the work done during the 12 months by the various sections of the Chamber, the report states that the members of the Scientific Instrument, Optical and Photographic Section had maintained a keen interest in the various stages through which the Safeguarding of Industries Act, 1921, had passed. Every effort was made to secure the passage of the measure, and to ensure the inclusion of scientific and optical instruments in the Schedule of Part 1 of the Act, which is now, of course, an accomplished fact.

GERMAN OPTICAL GOODS.—The Board of Trade give notice that they have received under Section 2 (1) (*b*) of the Safeguarding of Industries Act a complaint by the British Optical Instrument Manufacturers' Association, Ltd., the British Photographic Manufacturers' Association, the Spectacle Manufacturers' Association, and the Drawing Instrument Manufacturers' Association in regard to the sale of optical and other scientific instruments manufactured in Germany. The Board of Trade, in exercise of the powers conferred upon them by Part II. of the Safeguarding of Industries Act, 1921, have referred the matter for inquiry to a Committee constituted for the purpose of that part of the Act and consisting of :—Sir R. Henry Rew, K.C.B. (Chairman), Mr. A. K. Davies, Mr. Rayner Goddard, Mr. A. E. Holmes, and Mr. J. F. Mason, J.P. The Committee propose to hold their first sitting for the taking of evidence at 3 p.m. on Monday, May 15,. 1922, at the Hotel Windsor (Mines Department), Victoria Street, London, S.W.1. The Secretary to the Committee is Mr. T. Turner, Board of Trade, Great George Street, London, S.W.1, to whom all communications should be addressed. In accordance with the statutory rules applying to the procedure of committees appointed under the Safeguarding of Industries Act, the sittings of the committee at which evidence is taken shall be held in public, except that the committee shall refuse to allow the public to be present at any proceedings during the hearing of evidence on matters which, in their opinion, are of a confidential character.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE EXHIBITION OF AMERICAN PICTORIAL PORTRAITURE.

To the Editors.

Gentlemen,—The Exhibition of American Pictorial Portraiture, which is now being held in connection with the Photographic Fair, has this feature of interest, that, being entirely composed of the work of the one country, an opportunity is afforded of comparing American portraiture in its general characteristics with our own. That the recognised leaders in photographic portraiture in that country have not exhibited is not surprising, considering the conditions of the competition. The valuable cup, which was the sole prize, was well worth winning, and the authority of the appointed judge, Mr. William Crooke, of Edinburgh, is beyond question, but there could only be one winner, and in the keen competition for supremacy the fear of being among the losers has proved more potent than the expectation of being exalted.

The competitors, I should judge, are generally of a similar class to the best photographers of our medium-size towns, and the second best of the more important towns and cities; that is to say, the best of our photographers, excluding the comparatively few whose reputation and whose work are well known to everyone in photographic circles. The exhibition, as a whole, no doubt would have gained in some respects by the rejection of perhaps thirty more prints than have been rejected, but it was considered that its purpose would be better served by hanging each exhibition set as a whole, wherever possible. Everyone who sent in has had at least two pictures hung. A few only have been rejected—all small prints—and in each case it was an act of mercy as well as of necessity arising from want of space. Thus the opportunity has been given of seeing both what the author rightfully thinks is good work, but also what he wrongfully believes so.

It is quite clear that our brethren across the seas are, most of them, as liable to fail in choosing the best of their work for exhibition as specimens of what they can do as most of our own professional photographers are. In many cases a set of six on the walls consists of three, four or five very creditable pictures, good, sound every-day professional work, and the remainder of an altogether lower standard. This clearly arises from want of ability to distinguish the good from the bad. Probably a better set might have been chosen from the specimens on the reception-room table. There are a few exhibits that can only be described as freaks. An attempt at originality in the treatment of the subject, it if succeeds, may be a work of genius, but if it fails it is merely a freak. The divisional line is a very narrow one. An unusual treatment of the print, if the result is unpleasing, may also be described as a freak. There are a few examples of that, but, on the other hand, there are prints unusual in appearance that require closely looking into to discover the method employed, that are pleasing.

There are not so many examples of "spot lighting" as one might expect to find. It is a very valuable aid to effects when skilfully used, but the ignorant are apt to imagine that it may be used indiscriminately; that because it is fashionable it must necessarily be good. There are examples both of its good use and misuse.

Many of the exhibitors sent letters, on their usual letter paper, notifying the sending off of their pictures, printed with a list of their awards at various exhibitions in the States. It is evident that many professional photographers there make a practice of exhibiting their work publicly. It is a practice that should be more frequently followed here. There is no method of learning the faults of one's work more effectual than seeing it in contrast with that of others, but in preparing work for exhibition some thought should be bestowed on the conditions to be dealt with in preparing an exhibition. A photographer may imagine that a large margin of mount to his print will enhance its effect, but wall space is limited in extent, and an unreasonable area of mount may entail the alternative either of cutting down the mount or rejecting the picture altogether. To send a print under 12 x 10 on a 24-in. mount is almost an outrage.

In these notes I have dealt more particularly with the faults to be discerned, but it must not be supposed that they are greatly conspicuous in the exhibition. The collection is really a very interesting one, and is strikingly different from what a similar collection of British professional work would be, and the prints generally are much larger. In America large direct photographs have always been more popular than here, possibly because they have more money to spend. If I have suggested practically only what there is to avoid, it is not because there is little to admire, but simply because I should have to extend my article to more than double its length, and the space is not available.

ALEXANDER MACKIE.

PHOTOGRAPHERS' STATIONERY.

To the Editors.

Gentlemen,—Allow us to thank you very much indeed for the kind reference you make to our letter headings in yours of to-day. You will see from the enclosed tabulated list that we have gone pretty thoroughly into this of late, and have added a considerable number of new designs. No charge whatever is made for the use of these designs, which have almost all the virtue of an original

design to the individuals using them, because we restrict their use to certain localities—that is, if a photographer in any one reasonably limited district uses a certain design, we do not allow that design to be used by any other photographer in that district.

While we are on the subject of photographers' work, we might again refer to a subject that you have often dealt with, and that is the aptitude of photographers for dealing with block orders and printing because of their having the *initial stages* in their hands, and in this respect it might do no harm to tell you of an experience which happened recently. We had made about a dozen blocks for a photographer in the South; he advised his principals (a very large though newly founded factory) that he knew a place where he could get the printing done specially well, and he received the order, which he placed with us. That in itself was a fairly good order, and the firm concerned were so extraordinarily pleased with it that they gave the photographer a handsome honorarium in order that they might be allowed to deal direct with us for a particularly urgent job. This is unusual, perhaps, but the photographer was a good deal more than satisfied with his share in the transaction, which would never have come his way but for his enterprise in the profitable art of *suggesting*.—With compliments,

Yours faithfully,

HAROLD HOOD.

Middlesbrough, April 28.

SYSTEM IN HALF-TONE OPERATING.

To the Editors.

Gentlemen,—Judging by the discussions and differences of opinion which still continue to appear in photographic journals on the optical and precise control of the dot formation of ruled screen negative making for half-tone printing, it is evident that even the most experienced operators and authorities have different views on the subject, and to those who are engaged professionally in this particular line of work the publication of the opinion of such authorities is most interesting and valuable. Screen negative making is one of those lines of work which with a little practice and experience and sane judgment and an appreciation of the basis of relative control of such photography, can soon be operated by an average photographer either wet or dry—but as in most other sciences there is just the difference between getting first-class results and the other sort, the difference which will always exist between the work of men of different degrees of intelligence, which includes carefulness, thoroughness, cleanliness and such attributes, in addition to the essential scientific knowledge.

No doubt the majority of screen plate operators are capable, and actually do make suitable negatives, which leave little room for fault finding, as is evidenced by the enormous number of illustrations in books, newspapers, periodicals, etc., which are continually being produced and printed by this method, but I think I am right in saying that in the great majority of cases the screen plate negatives from which these illustrations are made are produced by men who work by "rule of thumb," viz., by constant repetition and familiarity with this class of work, they become so accustomed to getting certain results by certain operations that they know instinctively what the result will be, and if there be a certain percentage of results that may not fulfil ideal conditions, they can still be used for the purpose, and need not be made over again. To produce the highest quality of screen negative requires a niceness of relative adjustment that only a comparative few operators really appreciate and understand, or will take the trouble to make; in other words, the calculations of most operators are only approximate, and although some of the results may be quite good, it is frequently a case of "near enough, but might be better." The point seems to be that because there is a certain amount of latitude in the extent to which the same aperture and the same screen distance can be used with various camera extensions, this fact is abused, because it would mean a little extra trouble in making more accurate calculations, and having a larger supply of stops to choose from, the deficiencies being partly made good by later aids in cutting and faking, which are liable to injure tone values and gradation, and possibly convert an otherwise good quality negative into a second-rate one, and it seems to me that it is exactly on this point that such a system as the Doutitt apparatus supplies a simple and efficient method of accurate control.

Although the screen negative is primarily responsible for obtaining the desired result in arriving at the ultimate printing effect, there are other factors which must be taken into consideration, which may do much to improve or mar the quality of the final impression. In letterpress block making, which is mostly used in producing the illustrations in question, the etcher may easily destroy the good qualities produced by a good screen negative, by injudicious handling, in which case a second-rate negative would have answered the purpose just as well. Forcing the etching and biting to too great a depth will have this effect, converting a smooth dot into a ragged dot, the difference between machine etching and still bath or rocking—face up or face down—bad or good staging or stopping out, may make all the difference in the appearance of the result, not to mention degrees of quality in printing and paper. Even now, after many years of practical application of the process, the last word has certainly not been said as to the actual scientific effect of interposing the ruled screen which produces the screen negative. Some of the most expert operators have their own methods and pet theories on the technicalities and effect of the action of light through the half-tone screen, such as the effect of diffraction.

But are the advantages sufficient to make it worth while? Can those who advocate consideration and measurement of diffraction show superior system, speed or quality of results? And if diffraction why not reflection, halation, absorption and other variations which may take place? I think not. Life is too short, and the customer wants the job. The main thing that the operator has to concern himself with is to be as exact as possible in applying the working hypothesis which is at the root of the whole business, that the ratio of screen distance is to the screen ruling as the aperture is to the camera extension, and working accurately on this basis, the other factors do not materially affect the result.—Yours faithfully,

LOUIS H. JOHNSON.

38, Heathhurst Road, Hampstead, London.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

J. C.—We do not think that the fault in the photograph (if any exists, which we cannot say without seeing the child) is due to the focal length of the lens. It is probably due to an unfortunate point of view, which makes the baby look lumpy and which also makes the roost of the chair.

J. B.—A mirror or prism fitting is almost always used in studios of photo-engravers and the firms catering for them could easily supply you with one. You should apply for quotation to, say, Messrs. Penrose and Co., 109, Farringdon Road, London, E.C.1; or to Messrs. Hunters, Ltd., 16-18, St. Bride Street, London, E.C.4; or to any of the lens makers.

VENTO.—(1) The cost of registration is 5s., address Registrar of Business Names, 4, Clement's Inn, London, W.C.2. (2) Mr. John H. Gear, 8, Nottingham Terrace, Marylebone Road, London, N.W.1, is. Without claiming to be fully acquainted with the intricacies of the National Insurance Act we think an employee of the kind you mention certainly requires to be insured under the Act.

L. B.—It should not be difficult to colour the two parts of the lantern slide with dyes such as those you can conveniently buy in sets. They are put up by Johnson & Sons and the Vanguard Manufacturing Co., and are obtainable at any photographic dealers. If you don't want to do the colouring yourself you can easily send it to a trade firm, such as Messrs. E. B. Fry, 110, Pratt Street, London, N.W.1.

T. S.—Your proposed new position of the lamps seems to be about right, and the lanterns will do very well, though they would be better if D shaped instead of square. For children we should think it well to have at least three of the lamps to draw down to about 5 ft. from the floor. This will more than double their light-value as compared with the present position. We think that you will be quite safe in buying either of the lenses mentioned. The Aldis has the advantage of the soft focus if you care for it.

C. B.—(1) If it is only a slight scratch it has no detrimental effect whatever upon the portrait taken with the lens. (2) Probably there is no necessity for the lens to be repolished. (3) Although you say the lens consists of one glass, we think it consists of at least two glasses cemented together and indistinguishable from one glass unless you take the combination out of its metal mount and examine the edges. A lens consisting simply of one piece of glass does not form a satisfactory photographic objective unless stopped down to a very small aperture.

T. E. B.—There have been many processes suggested for conversion of a negative image into a positive (as in the Autochrome process) when using ordinary plates or bromide paper, but they are all rather complicated and somewhat uncertain. If you want to guarantee the completion of a result within a certain time, you had far better abandon the idea of using one of these methods and simply print from the wet negative, with interposition of a thin sheet of celluloid. Messrs. Rheinlander (New Malden, Surrey) make a specialty of celluloid of the required thickness for this purpose.

V. B.—Lead-lined tanks are used, but it is not the easiest thing to make them watertight, and if you are going to make the tanks yourself, and are fairly expert in woodworking, we recommend all-teak tanks. If the woodwork is really good, they are watertight, and require only very little caulking with red lead and linseed oil when putting together. But unless you can make them really well, we think it would be waste of time and money to do the work yourself. Excellent tanks, specially made and designed for quantity film work, are a specialty of Messrs. Otter-Judge and Co., 45-47, Rudyard Road, Hillsbro', Sheffield.

T. T. M.—The customer is quite within his rights in having even the first proof copied, and you are quite mistaken in thinking that the copyright becomes your property in consequence of his having done so. Inasmuch as he gave you the order to take the photographs, the copyright thereby became his, and it is not taken away from him by the fact that he has not paid for the sitting. Your remedy consists in suing him for the money, and in taking that course you are practically certain to obtain judgment against him in the County Court, since you can show that he has thought your work good enough to have copies made of it. If it was worth his while to do that, it is impossible for him to deny that the work was satisfactory.

W. J. B.—The buyers of such studies are chiefly agents for general advertisers, such as Bovril, Cadbury, and similar firms, and the publishers of calendars and photographs for the tops of chocolate boxes, etc. We give you the addresses of some firms who are agents for advertisers: Association of Designers, Ltd., 24, Devonshire Street, London, W.C.; Byron Studios, 8, Farringdon Avenue, London, E.C.4; Cambridge Literary and Art Agency, 8, Henrietta Street, London, W.C.; Carlton Studio, 30, Bedford Street, London, W.C.2; Francis and Mills, Granville House, Arundel Street, London, W.C.2; S. W. Partridge and Co., 21-22, Old Bailey, London, E.C.1; Rogers and Co., 22, Chancery Lane, London, E.C.4. As regards the calendar and box top people, the Rotary Photographic Co., West Drayton, Middlesex, is one of the largest producers. Very frequently in the calendar and box top trade studies are purchased in sets of six.

W. B. K.—The reflex type of camera is not suitable for wide-angle work, owing to the fact that space must be allowed for the swing of the mirror between the lens and the plate. Cameras have been made to get over this difficulty, but, generally speaking, the shortest focal length that can be used on the average quarter-plate reflex is about 5½ inches. There is no reflex which, in the quarter-plate size, will take such a short focus as 4 inches. If your intended branch of work is architectural interiors, you need not regret giving up the idea of a reflex, which is a very awkward instrument for interior work, where it has to be used on a tripod and often at a height which makes the viewing of the subject down the hood a very inconvenient operation.

W. B.—The most suitable focal length of lens for enlarging from half-plate negatives is about 9 ins. As regards the type, if you are enlarging by daylight, any objective which will cover a half-plate properly to the corners with be satisfactory for enlarging, so that the only question is the price that you are prepared to pay for the large aperture which will reduce the exposure. But if you are using artificial light, such as enclosed arc, it is not so easy, since many lenses, even high-class anastigmats, do not work correctly to focus when employed with an arc light. Generally speaking an ordinary R.R. lens, or one of the old more rapid euryscopes, is better for this purpose than many anastigmats, but you should get one or two on approval, and try them.

F. A.—You certainly cannot copyright a name for business purposes, and we do not think you can register such a name. What you can register is a name or mark to apply to particular goods made by you, or specially issued by you. A circular of information respecting such registration is obtainable from the Registrar of Trade Marks, 25, Southampton Buildings, London, W.C.2. If you employ a fancy name, such as either of those you mention, for the purposes of your trade, you are required by the Business Names Act to register the name, but that registration does not carry with it any exclusive right in the trade names which you adopt. Another firm might be using them elsewhere. If the same names were used by an immediate competitor you would no doubt have a remedy under common law, that is to say apart from any registration of a trade mark.

H. G.—(1) Personally we should think a 12-inch lens a very awkward and inconvenient choice for a quarter-plate reflex. There would be so many subjects, at any rate, such as we should want to photograph, for which such a lens would cover much too narrow an angle. It would mean that you could only deal with subjects for which you could take a distant view-point. We understand that this is what you want for the sake of the more natural perspective, inasmuch as the perspective depends solely upon the view-point, and has nothing whatever to do with the focal length of the lens, which latter simply determines the scale or size of the image. Even so we think 7½ inches is quite long enough for a quarter-plate camera. With a first-rate lens you should get all the facility you want as regards distant standpoints by contenting yourself with a smaller picture and corresponding enlargement of the negative. (2) We would infinitely prefer the quarter-plate "Soho," although it must be admitted that purely for portraiture the half-plate with a 17-inch lens would be a good outfit, although impossibly bulky and slow in use for outdoor work. Most people that we ever heard of have soon got disgusted with a half-plate reflex, and our own personal preference, after some wide experience of reflex cameras, is for the 3½ x 2½ size. We rather gather from your letter that you are laying unnecessary importance on getting a big picture on the negative. Possibly the people whose work you admire took smaller negatives than yours, but enlarged them considerably.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. PRICE FOURPENCE.

TERMS OF SUBSCRIPTION POST FREE.

UNITED KINGDOM OR CANADA.—*One Year*, £1 1s. 8d.; *Six Months*, 10s. 10d.; *Three Months*, 5s. 5d.

ANY OTHER PART OF THE WORLD.

One Year	£1	3s. 10d.
Six Months ...	12s.	0d.
Three Months	6s.	0d.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibits the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

HENRY GREENWOOD & Co., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3236. Vol. LXIX. FRIDAY, MAY 12, 1922. Price Fourpence.

Contents.

SUMMARY.

In some notes on the portraits at the Royal Academy Mr. F. C. Tilney has some strong words for some of the ultra-modern styles. (P. 275.)

In the further portion of his article on the business relations between a photographer and his customer "Pelham Swinton" seeks to present to the reader's mind the sequence of events which in many instances has brought a sitter back to the studio dissatisfied with the proofs which have been submitted. Counselling an invariable soft answer, he turns to condemn the free sitting business. (P. 277.)

In a leading article we refer to the qualities of instant recognition of pose and lighting and of psychological sympathy which enter largely into successful portraiture to such an extent as to make or mar its success, even when everything is technically perfect. (P. 274.)

The factors which exposure and development constitute in the variations of the scale of tones in a photograph are the subject of a more than usually informative article in the "Photographic Journal of America." (P. 279.)

Some of the considerations which enter into the value of the good-will of a business are the subject of a note on page 274.

The report of the last meeting of the Edinburgh Society of Professional Photographers recounts the steps which are contemplated for extending the scope of the Society's work in conjunction with the Glasgow and West of Scotland Society of Professional Photographers. (P. 284.)

Prospectus and entry form of the forthcoming exhibition of the Royal Photographic Society are now obtainable from the Secretary, 35, Russell Square, London, W.C.1. (P. 273.)

In delivering the R.P.S. Hurter and Driffield Memorial lecture on Tuesday evening last Professor The Svedberg gave a very interesting account of the researches by which he has recently extended our knowledge of the action of light on the silver bromide grains of photographic emulsions. (P. 283.)

Process and apparatus for the electrolytic etching of half-tone plates are described in a recent patent specification. (P. 281.)

Arrangements have been made for the outing of the Affiliation of Photographic Societies to be held in the neighbourhood of Hitchin on May 27. (P. 286.)

Particulars of the quartz lenses advocated for their greater transparency are contained in a recent patent specification. (P. 281.)

At the Croydon Camera Club some striking firelight and moonlight effects were shown with coloured films, the commercial source of which is said to be unknown to either the lecturer or the audience. (P. 283.)

Steadiness in holding is an important item in the use of a vest-pocket camera, in regard to which we give a hint on page 274.

EX CATHEDRA.

The R.P.S. Exhibition. The Royal Photographic Society announces that its sixty-seventh annual exhibition will be held again at the Society's house, 35, Russell Square, London, W.C.1, from Monday, September 18, to Saturday, October 28. The selecting committee and judges in the pictorial section are Messrs. Marcus Adams, Bertram Cox, J. Dudley Johnston, Alexander Keighley, Herbert Lambert and Furley Lewis. Section II. of the exhibition is for pictorial work in lantern-slides and colour transparencies and prints, whilst the technical section is this year divided into seven sub-sections, each with its selecting committee and judges, devoted to natural history photography, photo-micrography, radiography, astronomical, aerial and spectroscopical photography, stereoscopic transparencies, technical colour photography and applications of photography. An entry fee of 3s. 6d. is charged, covering any permissible number of entries in all sections. The regulations as regards mounting, which have been adopted during the last few years, apply again to the pictorial section. Those entering lantern-slides are asked to send with them a short description of the subjects, for use on those evenings when the slides will be publicly shown on the screen, as will be done on one or more occasions during the period of the exhibition. It is announced that an improved method of showing colour transparencies and lantern-slides by electric light will be installed. The last day for the receipt of exhibits by carrier is August 25; or Saturday, August 26, from 10 a.m. to 6 p.m., if delivered by hand. The prospectus and entry form are now obtainable from the Secretary of the Society, Mr. H. H. Blacklock, 35, Russell Square, London, W.C.1.

* * *

Grain and Speed. The Hurter and Driffield Memorial lecture delivered on Tuesday last by Professor Svedberg was a highly interesting review of a branch of investigation which has been generously enriched by Professor Svedberg's own researches. His theme was the properties of the ultimate constituents of the dry-plate emulsion, the minute grains of silver bromide or iodide, as regards their exposure to light. How much do we know of the property which makes one grain differ from another grain in sensitiveness or of the mechanism of the change which renders a grain developable? Professor Svedberg answers: Very little, indeed, of what is still to be discovered; but his discourse made clear, even to the layman in this subject, the essentially separate aspects of the problem and the different methods of experiment by which the dry-plate may be made to yield the secret of its sensitiveness. One conclusion from the extraordinarily ingenious and difficult researches of Dr. Svedberg is of special interest. He sees nothing contradictory in the existence of ultra-minute grains (of silver bromide) of great sensitiveness;

or perhaps he may be more accurately quoted as saying that the emulsion maker has no need to regard growth in the size of the grain as an inevitable accompaniment of greater speed of an emulsion. The progress in the manufacture of plates within the last few years may be said to point to the same conclusion, greater and greater speed having been obtained without the coarsening of grain which years ago was often a concomitant of added speed. When Professor Svedberg refers to "grain" he is, of course, speaking of the silver halide particles in the film, so minute as to be invisible to the eye, not to the clumps and aggregations of these grains when developed, which constitute what a photographer calls "grain," meaning "graininess," to use the term coined by the Eastman Laboratory. Nevertheless, it can hardly be imagined that a finer initial structure of the sensitive material in a plate will be without benefit to the finished negative in this respect.

* * *

Holding Small Cameras. Apparently many beginners in photography who start with one of the folding vest-pocket cameras obtain negatives which are defective through blurred definition owing to unsteadiness of the camera at the instant of exposure. More care is, of course, required to hold such a small camera steady than is necessary for a heavier instrument, but we have noticed amateurs inviting failure by holding the camera in one hand and operating a flexible release with the other. It is much easier to obtain a steady position by holding the camera with both hands, using a finger of one to actuate a trigger release. Moreover, there is an advantage in many circumstances of following this practice, since in dull light the shutter may be worked at a much lower speed and more ample exposure thus given. For the very sharpest results, of which the lenses of these small cameras are capable, there is no better plan than to give the camera a really rigid support, as by holding it on the top of a fence or by pressing it sideways against a post. We could instance, as an example of the advantage of this method, the work of a notable exhibitor whose 10 x 8 and 12 x 10 prints from vest-pocket negatives might easily be mistaken for those from plates of these sizes exposed directly in the camera.

* * *

Goodwill. When portrait businesses are changing hands "goodwill" is an asset, the name of which is, perhaps, more frequently on the lips of the seller than those of the buyer, and, therefore, it may be of interest to quote a definition of goodwill recently given by a financial newspaper, viz., "the probability that old customers will continue their patronage of a concern or business despite change of ownership." According to such a definition goodwill largely represents reputation, and in a business, such as that of photographic portraiture, reputation is naturally bound up in considerable measure with the personal accomplishments of the head of the firm, usually the photographer himself. Inasmuch as in most cases his services disappear under a new proprietorship, it may be argued that in proportion as the work of a studio represents the individual ability, as shown in the portraits, of its former proprietor, the value of goodwill is correspondingly diminished. On the other hand, it must not be overlooked that the abilities of the photographer in the studio represent only a part of the reputation of the business; the printing, mounting and other departments contribute their share. Hence, it cannot reasonably be held that goodwill in such circumstances is a negligible asset, and in any case the reputation of a business obtained by fair and honourable dealing from the business standpoint over a course of years is unquestionably an asset of great value to a newcomer. Other factors likewise enter into goodwill, for example, the position of a place of business. If the circumstances of a lease make it necessary for removal within a short time after purchase, that fact would, of course, depreciate the value attaching to the goodwill of the business.

A POINT IN PORTRAITURE.

THE beginner in portrait work is often at a loss to understand wherein lies the difference between a good portrait and a bad one. As far as he can judge, his posing does not differ from that of more experienced workers; his lighting may be satisfactory and his technique good, yet his portraits are more or less failures from the customer's point of view, for although most average people have no artistic education they are not slow to appreciate a portrait which is pleasing and characteristic. We believe that the solution of the problem is near at hand when the operator realises that what are apparently trifling variations in handling the sitter are really of the greatest importance in determining the nature of the result. As in all other artistic work success in portraiture depends upon a rapid and accurate faculty of observation, which with some is inherent and in others can only be acquired by careful study. This is proved by the success of many women photographers who make excellent portraits with a modicum of practical knowledge, the well-known intuition of their sex serving to carry them through.

The margin between success and failure is such a narrow one that it may be overstepped a hundred times unconsciously. The situation may best be explained by comparing it with the practice of cookery; here, an excess of seasoning, a trifle too long or too short a time in the oven, a heavy hand in mixing or handling, and all the theoretical knowledge in the world goes for nothing. So it is with photography; one may study all the books on art or technique in existence without avail, if the eye is not quick enough to catch the right pose at the right moment. With the same arrangement of light and the same sitter a dozen operators will obtain a dozen different renderings, some of which will be vastly superior to the others.

The great point to be realised is the smallness of the variation in position or lighting which makes so great a difference in the picture and, when this has been done, to make sure of securing exactly what has been seen upon the plate. It must always be remembered that the living model cannot be treated in the same way as a sculptured bust. There is always a chance of a slight alteration in the pose, between the time of posing and the exposure of the plate, so that the operator must see that his picture is right at the moment of pressing the bulb. Sometimes a slight alteration of the position of the head may be necessary to secure a better contour, but then it requires care that the lighting is not thereby altered. It is surprising what a great change in lighting is effected by a slight turn of the head. Many writers on studio work have taken up the point of view that lighting is practically dependent upon the manipulation of blinds and curtains, but this is only true to a limited extent, as anyone may prove for himself by observing the effect of change of position only upon a sitter lighted by an ordinary window. Therefore, the quickest and most effective way of working is to get the desired lighting by movement of the sitter, and to take the camera into such a position as will enable the desired view of the face to be obtained.

It is not wise to rely too much upon the focussing screen as an aid to composition and lighting. The inverted position of the figure and the brilliancy of the coloured image upon the ground glass are misleading. It is better, therefore, to limit the ground glass to its original functions of placing the image properly upon the plate and securing good definition. Posing and lighting can better be done by direct observation of the sitter, but here is a trap for the unwary. A difference of only a foot or two between the point of view of the lens and the eye of the operator may have a very considerable effect upon the result, especially when the distance between lens and sitter is small. Not only should the two view-points be kept as close together as possible laterally but also vertically. From time to time attempts have been made to introduce twin lens cameras into the studio, but in no instance has the experiment been successful, for the reason already stated. If the lenses were side by side different views of the nose and the contour of the face were seen by the finder and taking lenses, while if placed one above the other, there was a variation in the renderings of the nose, chin and forehead.

The young operator, while studying the physical characteristics of the sitter must not neglect the psychological aspect; that is to say, an effort should be made to secure a portrait in which an animated and agreeable expression exists. This rendering of expression is one of the greatest characteristics of modern portraiture, especially in the case of men, and it is only obtainable by handling the mentality of the sitter in the same delicate way as is necessary with his features. To do this it is obviously necessary that the photographer should attain a certain degree of culture if he aspires to a good class of business. Every man or woman is most at ease with his or her own class. A sitter in the West End expects to find West End manners, and a Lancashire operative is uneasy if the operator cannot speak his dialect and understand his prejudices, as more than one London photographer who has migrated northwards has found to his cost. This knowledge is necessary to get the necessary delicacy of treatment in bringing out points of character. In dealing with the sitter's features quarter inches are of consequence. What a light touch must be necessary when any attempt is made to play upon the emotions?

PORTRAITURE AT THE ROYAL ACADEMY.

The exhibition at Burlington House is distinctly one that will be damned with faint praise. The Selecting Committee being, presumably, unable to find anything of outstanding merit upon which a sensation might be founded, have made up the deficiency with a few of the real modern shockers that one discovers in the galleries of certain dealers. And these horrors are largely in the department of portraiture. What the Dean and Chapter of this respectable old institution expect to gain by destroying their reputation for academicism and putting nothing in its place is a thing difficult to see.

One More of G.B.S.

Room XI. is a room of horrors, and so is one of the sculpture halls as far as some of the paintings that figure there are concerned. To a photographer seeking something in the way of example, thirsty for inspiration, and anxious to acquire the art-principles that lift portraiture above mere likeness-taking, there is nothing but outrage in such things as Max Martin's "Portrait Group" (634), with its sordid ugliness and black stripy shadows. "Viva" (639), by Augustus E. John, has the vulgarity of a washerwoman in a red jerkin. Fortunately, his "G. Bernard Shaw, Esq." (675) has merit. Its fearlessness reflects the mental fearlessness of the sitter. If one looks into this work, it reveals a deal of painstaking effort not generally supposed to be characteristic of this devil-may-care painter. But for all this, the photographer who knows what sculptors' "planes" are and what modelling is, will find Mr. Shaw's high brow strangely mis-shapen, as though it had been badly battered. He will also fail to find a spark of suggestion in the swipe and swirl which do duty for the sitter's clothing.

The chief value of the Academy show will be in the direction of occasional excellencies such as Harold Knight's two works, which are replete with the qualities that "modernists" try to arrive at by the path of lawlessness and extravagance. Mr. Knight's "Miriam" (617) is not only sound painting and draughtsmanship, it has character, life and beauty, with colour daring and intense enough to meet any requirement. It is the saving grace of Room XI. His "Head of a Girl" (240) is even finer, though less arresting. The youth and charm of the sitter is fully expressed; and in artistic arrangement, lighting, colour and feeling it is worthy to rank beside the old masters, the works of whom it would, by its modern vision surpass in realisation.

Decorativeness Overcomes Psychology.

The advantages which colour gives to the painter lead him to exploit his resources in half-length and full-length poses, and in this respect photography necessarily differs from painting by relying more upon the psychological content of heads only. The rich who commission portraits by painters want something fine and large; and you cannot make a very large thing of a head alone, therefore we see much ingenuity displayed by painters in designing their subjects, relying here upon elaborate costume or official robes, and there upon backgrounds and settings that shall be pictorial in themselves. The two portraits of "The Countess of Rocksavage," by Sargent (17) and Sims (177) respectively, reveal this effort. The first shows the lady in a historical costume, the other dispenses with costume as far as possible, and places the sitter and her son, also scantily clothed, before the pier between two arches of a loggia—a design of pronounced symmetry. Maurice Greiffenhagen's "Miss Janet Frizell" (25) is an arrangement of riotous and rich colour, supplied by the check jacket, bare legs, tow-selled red hair and flowered background, the whole thing being gorgeously decorative in its antique Italian frame, which must be several centuries old. The same painter's "Mrs. Jack Pettigrew" (115) is a head and shoulders of deep tone before an orange background, which relieves a fine "pattern"—a very distinguished work. A. Stuart Hill avails himself of the light tone of an old print of Worcester Cathedral on the wall to relieve the contours of the ex-Mayor of the town (135). Perhaps the most masterly use of academic robes in supplying decorative subject-matter is seen in Sir Wm. Orpen's "Sir Charles Villiers Stanford" (173), who is certainly looking picturesque beyond his wont. John M. Aiken adopts pure genre in "White to move and mate in three" (295). It is a beautifully painted portrait of a man looking down upon a chess board. Another idea by Ed. Brock is quite effective. His "Mrs. Eric Rose" (277) is in buff-coloured costume and wide-brimmed hat flooded with light and seated at full face. The background is of the "landscape" variety

à la Reynolds, only it is here given solidly as a dark wood with considerable realisation. Another of these fierce colour-contrasts has been employed by F. G. Swaish in his very striking "Mrs. George Heming" (44). This time the figure in rich low tones stands before the drawn curtain of a sunlit window. It is all cleverly true; but to photographers it is an old resource.

S. J. Solomon is too mature for such tricks, but he has sent a delightful portrait of the genre style called "Waiting" (529), a pretty young girl sitting on the arm of a chair, dressed, in black, for outdoors. All the domestic surroundings are choicely represented with quality of tone and colour, and all in perfect keeping. "The Producer" (590) is another genre portrait, a full-length of Mr. Du Maurier standing on the stage before the airy and dark background of the empty auditorium, the footlights behind him. He raises his hand with a managerial bearing. The Hon. John Collier is the artist of this distinctly new and quite successful idea. What a change from this to the close view of a woman and a child in bed and asleep, which M. Mackinlay sends and calls "La Siesta" (561). A work of this kind cannot be intended for anything but portraiture, but the idea is positively uninspired and unlovely.

Double Lighting.

There is a rather remarkable coincidence in the fashion for effects got by placing the sitter between conflicting lights. The painters, no less than the photographers, seem to catch at it as the last straw of novelty in a stream of stale tricks. Sir Wm. Orpen exhibits its misfortunes in the passage of dark tone that disfigures the brow and central features of "E. A. Colquhoun, Esq." (211). When either side of a face is in the limelight this must inevitably happen. Is it beautiful? Does it give the sitter's mental and moral characteristics their best chance? Much the same idea exists in Sir William's "Barbara Trevor Williams" (34), where the warmth of the reflected light from the left gives to the lady's skin a leathery look that must do her an injustice. In "E. J. Spencer, Esq." (89) the artist goes to the opposite extreme of a full flat lighting à la Holbein, a resource serving the sitter but little better; it is, therefore, a matter of relief that we find the normal lighting of an ordinary room adopted in his presentation portrait of "The Rt. Hon. Lord Bearsted of Maidstone" (99). May it not be assumed that the excellent character in this work is in some measure, at least, a result of this more ingenuous treatment? One more example of the futility of "stunt" lighting in portraiture is seen in brilliant illumination from below of "Major E. S. Pilkington's" riding breeches (418), the most assertive spot in the picture by M. B. Copeland.

Style and Pose.

Side by side with efforts to escape from the safe road of convention in the matter of lighting are those to avoid the usual thing in the general management of the theme. Allusion has already been made to backgrounds and effects adopted with these motives; but more striking still are the methods to get new ideas into the sitter's pose. The cases already cited of the genre motive are exercises in a direction which is legitimate and infinite, but unfortunately for novelty seekers, it is not new. Neither is the good old grand style which, if it lent some pomposity to a distinguished sitter, at least produced a work that was monumental in content. Such is the very commanding portrait by the veteran, Sir Arthur S. Cope, of "Field-Marshal H.R.H. the Duke of Connaught and Strathearn, K.G., K.T., K.P., etc.," who looks all these initials and much more, as he should. The grandiose air, the expansive pose, the full regimentals, the due swagger of ceremony are essential and valuable points. To turn from this good old-fashioned style to the new whim of Maurice Greiffenhagen in his "Sir Harry Gibson" (260) is to sigh for the old régime indeed. Sir Harry is in full military rig, and wears all his medals, but so far from looking what he should, he looks as though he had been pushed into a low, springy chair, where he has remained "all of a heap" and encumbered in an undignified way by his cocked and gold-laced hat and his gleaming sword of ceremony. His face expresses no more fine feeling than the circumstance would occasion. The painter has given to this picture, as likewise to "Major Frank Beattie" (231), the same opacity of black shadow, the same hot and deep scheme of colour, which mummifies the complexions, the same vacant wooden expressions. In the second example the soldier certainly does stand, but with no military air. The idea seems to have been to make these two gentlemen as much unlike soldiers as possible.

Charles Sims, on the other hand, was obviously determined to make "Sir Harry Frankland Hepburn" (224) look every inch the smart, well-groomed gentleman, and he has succeeded in achieving the outward signs of aristocracy in this ruddy-faced young-elderly man with white hair, grey moustache, society smile, easy but masterful pose, yellow gloves, stick, and not a speck upon his immaculate clothes. There is in the handling of this work, however, a technical shortcoming in the management of edges, the touchstone of good painting. Sir Charles Sims's soft and melting touch, so charming in the fanciful subjects he used to give us, seems unable to deal with the contours that cannot be baulked or faked in forcible portraiture. One feels that one could cut one's fingers on the knife-edge of "Mrs. H. B. Johnstone's" shoulders (264), and the neck of "Miss Monica Belfield" (10) is similarly edgy.

G. Hall Neale has made his portrait of "Chas Goddard, Esq." (343), irresistibly comic by an expression of doubt and apprehension with regard to the artist. The old gentleman's eye is keenly on the watch, and his hands on the arms of the chair ready to spring up at the first sign of any "larks." Is not such an effect one to be avoided at all costs in portraiture, as much as that of sleepy depression and mournfulness in Glyn Philpot's "Sisters of the Artist" (145)?

Psychology.

Of portraits which do wrestle with the personality of sitters rather than with their clothes and still-life effects there are several that will repay a photographer's study. And perhaps the most psychological is W. W. Russell's "Mrs. Walter Russell" (380), with her introspective look and listless hands. Another good example is S. J. Solomon's "Maurice Moscovitch" (297), a sound, life-like and interesting portrait.

The visitor will note the unnatural look of several portraits painted just a little below life-scale. It is not necessary to name them, as their littleness distinguishes them. In these spacious galleries the heads that are a little larger than life look right.

Groups.

What is said to be the year's sensation is Sargent's group, "Some General Officers of the Great War" (121). Imagine the task of managing twenty-two full-length figures, each of whom have equal claims to be adequately represented! And all in khaki! Of course, they had to be as nearly as possible in one line. The skill with which this appalling task has been carried through is worthy of Sargent's reputation. It is not the jumpy affair that Herkomer would probably have given us, but a quiet set of portraits in a gentle harmony that will do no harm to the works of the National Portrait Gallery, where it is to hang. Of other groups, the most successful, new and pleasing is that by George Harcourt, "Three Sisters" (158). One of these ladies reads a paper with outstretched arms and has her back to us, another stands at profile, and the third at full face; but they are all close together. It is all very cleverly managed. If the crowd in Richard Jack's "Marriage of H.R.H. Mary and Viscount Lascelles" (88) did not show an occasional profile, all but the officiating bishop in this monstrous futility would be portraits of back views: a rare piece of monumental historical painting to go down to posterity!

F. C. Tilney.

THE BUSINESS SIDE OF PROFESSIONAL PHOTOGRAPHY.

II. *(continued.)*—THE PHOTOGRAPHER AND HIS CLIENT.

Beyond this factor of artistic atmosphere, the handling of the customer by a photographer should follow the same rules as those of any average retailer. Firstly, the customer must, of course, be led to understand that his or her custom is valued and appreciated. This is at least one duty in which the photographer may engage with all the enthusiasm begotten by truth. He may not, on the other hand, experience the same conviction regarding the customer's opinions of his portraiture. And here is the most painful subject of all. A customer enters with her proofs, opens the wrapper, and throws them on the receptionist's table, exclaiming, "These are dreadful! Simply appalling! My friends didn't know me! They are *most* inartistic!" (referring, of course, to the proofs, not the friends). Now, if the photographer be standing by, or if the receptionist convey these remarks to him, his first feelings will be those of anger and resentment. In his opinion, the likeness is perfectly good; and he knows that there is certainly no cause for complaint as regards the artistic qualities of the photographs. On the contrary, he had taken more than usual trouble with this sitter, and he had achieved a pictorial result with which he was justly pleased. His first instinct, therefore, is to step forward, and to give a staunch denial to the lady's calumnies. If he is unwise, and his skin is yet untoughened, he will fall to the temptation, and the result will be an undignified argument, and a lost customer.

Now, let us follow the mental processes of such a customer, because it is only by understanding her psychology that we shall know how to deal with her, and ultimately to reduce her to amicability and reason.

The proofs arrive, perhaps, at breakfast time. The lady hands them to her husband for his opinion, and he, glancing from his morning paper, looks at them hurriedly. "They seem all right, my dear," he says, "but I don't like that dark shadow on the left side of your face." Then, having swallowed his last mouthful of coffee, he bolts for his 'bus or train. The proofs are now put aside for a few hours, and are forgotten, perhaps, until the afternoon, when a friend comes to call. "O, by the way, my dear," the lady exclaims, "I must show you the proofs of my photograph. They just arrived this morning. Now, what do you think of them?"

The friend looks at each carefully, and lays them down one by one. "I don't care for *that* one very much," she says, after a pause. "Your expression is better in this one; but what a pity your dress is so crumpled. Then, in *this* one, your hair isn't so nice. Where did you have them done?"

"At Jenkins and Son."

"O, Jenkins! Now, I wonder why these Jenkins people always make one's face look so dark on one side. I've noticed that in several of their photographs. I don't admire that sort of thing, do you?"

"I can't say I've noticed it," falters the lady. She is now somewhat disappointed, and is inclined to be annoyed, first with her friend, and then with the photographer.

Evening comes, and George drops in. George is the lady's brother-in-law. Moreover, he is an amateur photographer who develops his own films, and washes his prints in the bathroom basin.

"O, George, do give us your opinion on these. You understand these things. I'm sure I don't know what to think. Do you think they're at all like me?"

Now, I ask the reader, is there any erring human being capable of forgoing so glorious an opportunity as this? There is not. George, therefore, examines the prints critically, and pronounces them to be under-exposed, over-printed, over-exposed, under-developed, under-printed, over-developed, out of focus, too hard, too soft, or too flat, according to the extent of his photographic vocabulary. It is he, also, who first suggests the possibility of their being inartistic. The fire is laid, the tinder is dry, and this final remark sets the whole structure alight. "I believe you're right," exclaims the lady. "I think that dark shadow on the cheek *most* inartistic!"

At this point the husband inquires what is the price of the portraits. "Four guineas a dozen," says his wife.

"Four guineas a dozen!" exclaims the husband, who, unfortunately, is a commercial person, and does not appreciate the value of Art. "They're not worth more than four shillings!" George, who knows the retail price of self-toning paper, corroborates this opinion. "Just you take these back to Mr. Jenkins to-morrow, Margaret, and tell him from me that he'd better produce something a great deal better of you than that, if he is to get four guineas for them!"

Thus, by a steady process of inflammation, the poor lady arrives at the studio in a mental condition composed of disappointment 50 per cent., impatience 30 per cent., and mistrust 20 per cent. Instead of arguing with his customer, therefore, the photographer must bottle up any feelings of indignation which may arise, and set out to dissolve these psychological constituents. He should say something like this:

"I'm sorry to hear you don't like the proofs, Mrs. Brown. What is it you don't care for?"

"O—it's the expression, Mr. Jenkins. People say they aren't a bit like me. And my dress isn't at all nice in this one, and I don't like that dark shadow on the . . . ."

Mr. Jenkins gently interrupts her. He has heard all this before, and knows how to deal with it. "I'm very sorry indeed, Mrs. Brown. Of course, we must please you. Let me take one or two more negatives of you. I quite see what you wish, and I know now what to avoid. I should suggest also that these new ones be taken with a light background, which will obviate the heavy shadows of which you complain. Now, I wonder what day would suit you. . . . ."

The lady is now quite mollified. Her feelings of disappointment have gone; her impatience vanishes at the possibility of a further sitting as soon as she wishes; and her faith is restored. She makes an appointment, and leaves the room apologising to Mr. Jenkins for giving him so much trouble. He, of course, assures her that it is no trouble, and that he makes a point always of satisfying his clients. And here the story ends—except that, in nine cases out of ten, the lady orders from the first proofs after all.

This, of course, is only one instance; but similar treatment can be applied in most other cases. I can hear a photographer say, "Yes, that is all very well, but, after all, the first proofs were perfectly good. Why should I be obliged to suffer this extra expense merely because of a customer's ignorance? I would rather lose such a customer than submit to injustice of this kind!"

My dear sir, you are a fool; firstly, because you do not realise that you are conducting business in an unjust world, and secondly, because you do not realise the first principles of conducting business. It must never be forgotten that justice, being one of the higher ideals, is correspondingly expensive, and that even in this, our own country—peopled

with all the teeming millions of persons who never will be slaves—the price of justice is always measured by law-court expenses. And no one who is not a lunatic, or a gentleman of unlimited means, will ever contemplate so ruinous a purchase. Secondly, have you ever considered the financial loss to your business which may be caused by one dissatisfied customer? Have you ever heard gentle ladies discussing the merits and demerits of their respective drapers, grocers, and butchers? If you have never experienced this gratification, arrange to be present on the next occasion on which your wife has friends to tea, and listen with horror to the utter defamation of quite respectable firms, and watch how the most costly reputations are made gradually to fade away before the eyes of all present. It is necessary only to transpose, in your imagination, the name of your own firm for one of these, and turn pale.

The same rules apply, of course, to the answering of correspondence. When a customer sends a letter not entirely in accordance with the best aspirations of well-bred people—as customers have been known to do—one's first temptation is to answer it in a not unsimilar manner. If the recipient is a person of tender susceptibilities, he will not be able to overcome this temptation, and he will reply accordingly. By all means, let him reply, and as vindictively as his powers of composition will allow; but let him not post the letter until the following day. He will then put it in the waste-paper basket, and write something sensible instead.

This unfailing use of the gentle answer to turn away wrath is not only a good moral precept, but an excellent business proposition—and one which may cause many a photographer to see something in Christianity after all.

Now, the photographer may have successfully gauged the taste of his public, procured suitable specimens, displayed them in tasteful show-cases, and achieved an atmosphere of Art. All this he may have done, and done wisely; but now he feels that the public are not patronising him in such numbers as he thinks right. He becomes impatient, and one day the thought occurs to him that if only he could find some means of enticing the public into his studio more rapidly than by the usual methods he would enlarge his *clientele* by 100 or 200 per cent., and acquire, in a short time, a very comfortable income. The most obvious method of doing this is to invite people to be photographed. Why not? A carefully worded and flattering letter is all that is necessary, and any excuse—that their portrait is urgently required by the Press, or the absolute necessity of their photograph being secured in order to complete a collection of Solicitors, J.P.'s, M.P.'s, O.B.E.'s, Bank Clerks, Insurance Agents, or Country Squires—is easily arranged. A little such delicate flattery will be found to yield a ready response; and the letter should include the information that a set of proofs will be supplied, finished in an entirely new process, by which all necessity for touching, or retouching, or developing, or printing, is now happily dispensed with. This remark regarding the new process serves to pique the recipient's curiosity, while at the same time it extends to him the glittering possibility of obtaining a style of portrait which his friends have never seen. He is right. They will never have seen anything like it.

If the photographer is weak of mind, or deficient in ordinary business foresight, he may decide to adopt this policy. For a year or two he will do well; but after a certain period, when he has squeezed from the various societies, professions, associations, trades, and classes, all that is to be obtained therefrom, he will look round once more for the assistance of his ordinary legitimate business, and, behold! he will find this well-nigh vanished away. He has entirely forgotten that a large part of the successful conduct of his business depended upon the value which the private person placed upon his work. It was for this that he arranged all the attractive displays and the artistic atmosphere. But how can he expect the public to place value upon a commodity which he now gives away for nothing? It must be remembered that the public do not trust entirely to their own judgment. They see an article which pleases them, and they believe it to be good; but this opinion is not finally confirmed and sealed until they learn the price. If the price be a high one, they say: "O yes, I thought so. It's beautiful, isn't it?" But if the price be discovered to be lower than was anticipated, they immediately lower their estimate of the article. Even although a photograph please a person to the point of admiration—if he or she learns that the price is low, that admiration will drop to the level of the price.

What, then, is this photographer to do? If he has the courage to stop his free-sitting practices, he will do so, and gradually regain the respect of the public. But, if he has not, he must continue as he has begun, and endeavour by some means to extend his field of activity. It is for this reason that firms who practise this system to-day must always seek business far beyond the limits of the district in which they are situated. As this range is increased so does the cost increase, and, sooner or later, they are caught in the death-grip of the economic law of decreasing return. Those few who survive must sink to the level of commercial concerns producing a mere percentage on capital; and, as capital in a photographic business is—or should be—a small item, such firms must either swell their capital to an abnormal extent or become not worth the carrying on. A small free-sitting business is a contradiction in terms. Such a thing cannot exist.

The free-sitting system is like a drug; the more a man takes of it the more he must consume in order to live. It is at once an admission on the part of its devotee that his work is inferior to that of his rivals, and that he must find some other means of luring the public to buy it. It must be gratifying to the moralist to observe so great an evidence of this type of professional modesty in such a city as London, where photographers vie with one another in a self-depreciatory humility unparalleled in the history of commerce.

The free-sitting idea must not be confused with advertising. Advertising is a healthy science, and serves merely to draw attention to the commodity, and to create a desire for it. It does not throw it away. Nor must the offering of a free sitting be confounded with the practice of giving a free sample. A sample is always a very small portion of the actual commodity on sale; but the sitting is nine-tenths of the portrait. In it are contained all the photographer's skill, experience and personality.

Let not the aspiring photographer, therefore, be impatient. He has but three rules to follow: Supply the right kind of work, display it to advantage, and do all in his power to let the world know of it. To such an one will come reward in the fullness of time.

PELHAM SWINTON.

VALUE OF OLD PLATINUM PAPER.—"Most people know that platinum has gone up in price," writes a Lewisham correspondent, "but few may be aware of the extent of the increased value of the metal since pre-war days. During the annual domestic event known as spring cleaning some old platinum paper was discovered at the back of a cupboard in my workroom, paper purchased between fifteen and twenty years ago, and not suitable for printing upon to-day. I wrote to the Platinotype Company concerning it and the chance of getting some residue from it, and the company offered, and afterwards paid me, a little more for the old paper than I paid for it when new. This fact may be of interest to many of your readers."

EXPOSURE, DEVELOPMENT AND GRADATION OF TONES.

[Although the functions of exposure and development in modifying the scale of tone or contrast of the negative of a subject are fairly generally understood, there are perhaps many who have not made the matter as clear to themselves as is done in the following article by Mr. W. S. Davis in the "Photographic Journal of America."]

A KNOWLEDGE of how to secure with certainty a particular scale of tone is a most important asset to the photographer, since the successful representation of a subject—particularly the interpretation of some subtle quality of atmosphere or other delicate tonal effect—demands ability to work for a definite result.

Before intelligent control can be exercised it is necessary to understand both cause and effect, so the first point to consider is the factors involved.

The degree of contrast present in a subject is largely governed by the lighting, though the difference in tone and colour of individual parts, of course, contributes its share to the result. The *direction* from which the subject is lighted determines the *proportion* of light and shadow the subject-matter is capable of showing, but once the angle of illumination is fixed the *degree of contrast* presented varies with the *concentration* and *intensity* of the source of light. For these reasons one must not confuse flatness with softness, as the first is caused primarily by the subject being illuminated from an unsuitable direction, while the latter is brought about by diffusion of light coming from the proper source. To make this point perfectly clear, let the reader imagine himself studying under differing conditions an ordinary landscape comprising, as the principal features, a grassy foreground and group of good-sized trees in full foliage in the middle distance. With the sun back of the observer the entire scene will be flooded with light on a clear day, the amount of shadow being reduced to small areas among recessed parts of the foliage, and in consequence the general effect is that of flatness. Visit the locality when the sun is well to one side and a full play of light and shadow will be seen in the foliage, and any inequalities in surface of the foreground will appear in an attractive series of minor tone gradation. Again, view the scene when the sun is back of the trees and a still greater amount of shadow will be visible, since not only the side of the trees toward the spectator are in shadow, but long ones from the trees are cast upon the foreground. Repetition of these visits at the same hours on a day, when the intensity of the sunshine is reduced by the presence of a thin haze or mist, will reveal the fact that, while the general arrangement of light and shadow is the same as before, the scale of contrast is much shorter, due to the lighter tones being less brilliant and the shadows greyer in quality. The weaker the light becomes the greater the difference in this respect, until on a dull, cloudy day the illumination is so diffused as to cause well-defined gradations of light and shadow to disappear entirely. The same effects can be demonstrated indoors by posing a model or still-life group so that the light from a window strikes the subject from different directions; intensity of illumination being in this case altered by changing the distance between subject and window or covering the latter with semi-transparent material.

As so much depends upon proper illumination of a subject it is useless to expect modification of the purely photographic technique of exposure and development to overcome mistakes of lighting, but given an effect which looks agreeable to the eye, and there is no question that the amount of contrast shown in the finished photograph can be varied to a wide degree by straight methods of manipulation—the tone-scale being shortened or lengthened according to taste.

The length of the exposure and duration of development are the two most important factors in determining the general range of contrast shown in the negative, though in practice the nature of the sensitive emulsion, action of different light-filters, and changes in composition of the developer influence the result, but when using any selected combination of plate, filter and developer, the fact remains that the governing factors are exposure and development.

The length of the exposure determines the manner in which the proportional steps of tone are recorded, setting aside for the moment discrepancies due to unequal sensitiveness of the emulsion to different colours of the same tonal value. Theoretically correct exposure is that which reproduces accurately upon the film the relative position of each tone as it exists in the subject. Under- or over-exposure causes an unequal rendition of the tone-scale, the first sharpening contrast at the lighter end combined with failure to show differences of tonality in the shadows, while the second reduces the separation between each tone in the entire scale, thus shortening the range of contrast; this effect being most marked in the lighter passages.

The action of any developer is to build up contrast as its action is prolonged; hence it follows that stopping development at an early stage produces a flat image, which, be it noted, may appear very thin or decidedly dense according to the amount of exposure the negative has received, for which reason it is a mistake to judge the printing quality wholly by the degree of opacity. While prolonging the time of development increases the scale of contrast up to a certain point, the limit is reached when the highest light in the subject becomes opaque. If development is continued beyond this stage, the next lighter tones will one after another become opaque, thus destroying the steps of gradation at the lighter end of the scale, and to this extent lessening the number of those remaining.

From the practical point of view the only tone gradations of value in a negative are those which can be reproduced in inverse ratio by the printing medium employed to produce the finished picture; consequently, it is proper to point out the fact that a print on paper cannot show as long an actual scale of tone which it is possible to record in a negative, for the reason that a transparent image, viewed by strong transmitted light, represents between the extremes of complete transparency and absolute opacity a greater degree of contrast than that presented by pure white and black upon paper, as the latter is, of necessity, seen only by the light reflected from the surface. For this reason it is necessary to keep the range of gradation in the negative within the limitation of the printing-medium to reproduce, which varies considerably with the process used. Bromide paper or the carbon process, for example, will render a longer scale of tones than the harder-working slow "gaslight" or developing-out papers.

In addition to the cumulative effect of time development upon contrast, further control is obtainable by changing the composition of the developing solution. The developing agents in common use may be roughly divided into two classes: those which bring out detail all over before sufficient printing strength is reached in the negative, and the kind which build up opacity simultaneously with the appearance of gradation. The first, of which pyro is a typical example, are often known as high-factor developers because in timing development by the factorial method the time of appearance of the high-lights must be multiplied to a greater extent to arrive at the total time the developer should be allowed to act than is the case

with agents in the second class, like hydroquinone, which possesses a low factor. Pyro stands by itself, as it possesses the properties of both classes, requiring a high factor when used in weak solution without bromide, while the reverse is true when the solution is concentrated and a considerable amount of bromide is added. Obviously, it is an advantage to employ a developer of the first class when a soft negative is wanted, especially when the subject possesses an excessive amount of contrast, since the ability to bring out detail in the shadows before full printing strength is reached allows one to stop the action at the desired stage without needless sacrifice of gradation in any part. Dilution of a developer also seems to assist in securing greater softness, as it allows ample time for even action to take place, but it should be understood that dilution, or the selection of a high-factor agent, simply retards the building up of contrast; the result if pushed to the limit being similar to what is obtained with a low factor one, but it is of course necessary to develop to the limit. Increasing the normal amount of alkali, sodium or potassium carbonate tends to bring out detail proportionately quicker than opacity, but with extremely sensitive emulsions is liable to produce chemical fog. Potassium bromide should be omitted when the maximum amount of softness is wanted, or if its employment is absolutely needful to prevent the appearance of chemical fog in the brand of plate used, the amount should be reduced to the minimum.

The addition of a considerable amount of bromide before development is begun retards the first appearance of the image, and if development is continued a sufficient length of time increases the amount of contrast obtainable, but the greatest amount of control in this respect is secured by using such an agent as hydroquinone or pyro in strong solution, to which is added about one-fourth the amount of bromide as the weight of developing agent employed. The time of appearance is by this means much retarded, especially in the shadow portions of the subject; the opacity of the lighter tones building up slowly, but steadily, and if these appear to be gaining too much in proportion to the shadows, the partly developed negative can be transferred to a normal solution for finishing.

So far the element of colour in the subject has not been dealt with, but as the majority of views exhibit colours to which the emulsion reacts in a different manner than their visual appearance might lead the uninitiated to suppose, it is necessary either to make allowance for their unequal actinic action or take means for overcoming it. As every camera user soon finds out, blue and violet exert also as powerful an action upon a plain bromide of silver emulsion as white, being far more actinic than other colours of the same tone. Even colour-sensitised plates are not free from this defect, but there is this important difference, the latter possess increased sensitiveness to yellow, light orange and yellow-green, in the case of an orthochromatised emulsion, and a panchromatic variety is even more sensitive to the colours just mentioned, besides possessing the ability to record deep orange and red. This being true, the only thing necessary for obtaining a balanced rendering of various colours is to retard the activity of the over-actinic ones, for which purpose a suitable colour screen or light-filter is used over, or behind the lens. A yellow filter serves the purpose by converting the visual tint of blue to the less active green, and violet to a grey tone. The degree of correction obtained depends upon the depth of yellow and its spectroscopic quality, some shades being far more suitable than others, which is sufficient reason for purchasing filters only from reliable makers.

In practice, the advanced worker can make good use of several filters, ranging from a pale to a deep yellow, the first being used when but partial correction is desired, or only a limited increase in exposure is allowable, while the deepest is reserved for full, or even over, correction of the blue. A deep light-filter is at times helpful in controlling contrast when, as is quite often the case, the greater portion of the light tones are of a blue or violet tint, since retarding the action of these is then equivalent to shortening the photographic scale of contrast. The same means may be employed to deepen the tone, and clear up detail, in a distance obscured by blue haze. When, however, it is desired to accent the over-actinic colours, as for instance to exaggerate the effect of slight mistiness in distant parts of a landscape, a filter should not be used.

To sum up the foregoing observations, a normal result may be defined as one arrived at by timing the exposure to just record the deepest tone present in the subject by the time the high-lights in the negative have reached correct printing opacity in the course of development. Variations from the normal rendering may be obtained as follows:—

To increase contrast. Give the minimum exposure which will register the deepest visible tone and extend development beyond the normal time. If still more contrast is wanted, use a concentrated developer containing an extra amount of bromide, preferably choosing a low factor developing agent.

To especially emphasise the high-lights, while suppressing gradation in the shadows, slightly underexpose, and stop development as soon as the light and middle-tones attain printing strength, thus leaving the shadows very thin in the negative.

To reduce contrast, use a light-filter, when such will assist, as previously noted. Then if only a slight modification is needed, as in the case of a normally lighted subject, give full, but not over, exposure for the deepest parts and shorten the usual period of development. If more reduction of contrast is desired, use a dilute developer made up with a high factor agent and omit bromide. If still more softness of effect is called for, as in a harshly lighted subject showing very excessive contrasts, give several times the normal amount of exposure and develop to suit the lighter tones. By increasing exposure and reducing the length of development a good deal of control can be exercised, but the rendering of the relative intensity of the tones will not be literally true to the subject, though from a pictorial viewpoint the effect may sometimes be better, notwithstanding.

WILLIAM S. DAVIS.

FORTHCOMING EXHIBITIONS.

April 22 to May 27.—Royal Photographic Society. Colonial prints arranged by "The Amateur Photographer and Photography." Open daily from 11 to 5 p.m. 35, Russell Square, London, W.C.1.

June 1 to 30.—Royal Photographic Society. Prints by Pirie MacDonald, of New York.

August 26 to September 9.—Toronto Camera Club. Latest date for entries, July 22. Secretary, J. H. Mackay, Toronto Camera Club, 2, Gould Street, Toronto, Canada.

September 9 to October 7.—London Salon of Photography. Latest date for entries, August 30. Particulars from the Hon. Secretary, London Salon of Photography, 5a, Pall Mall East, London, S.W.1.

September 11 to 15.—Professional Photographers' Association, Princes Galleries, Piccadilly, London, W. (Trade and Professional). Hon. Secretary, Richard N. Speaight, 157, New Bond Street, London, W.1. Also foreign invitation loan exhibition of professional portraiture. Hon. Secretary, Marcus Adams, 43, Dover Street, London, W.1.

September 18 to October 28.—Royal Photographic Society Annual Exhibition. Latest date for entries, August 25 (carrier); August 26 (hand). Particulars from the Secretary, Royal Photographic Society 35, Russell Square, London, W.C.1.

Photo-Mechanical Notes.

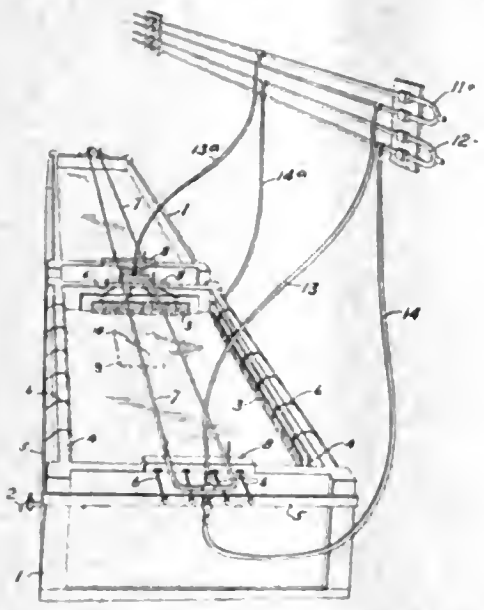
Electrolytic Etching.

According to a patent specification (No. 176,412) communicated by W. J. Mellersh-Jackson for The Weeks Photo-Engraving Co., 923, Sansom Street, Philadelphia, United States, the printed and burnt-in metal plate is subjected to the action of an electric current in a bath of electrolyte, consisting of a solution of sodium chloride to which a chloride of iron is added.

If desired, an acid, as well as a chloride of iron, may be added to the bath, and further, in some cases, depending on the nature of the metal and the electrolyte used, it may be advisable to immerse the plate in a hardening solution.

The electrical etching may be carried out in an apparatus such as that shown in the drawing.

In this drawing the numeral 1 designates the tank, which may be of any suitable waterproof and electrical insulating material, such as wood coated on the inside with an insulating, waterproof, and chemical resisting material. 2 is a drain cock for draining the tank for renewing the electrolyte or for repairs. Supported on frames 4 along the four sides of the tank are several cathodes 3 of any suitable conducting material, but preferably of carbon, which cathodes are electrically connected to a conductor or bus bar 5 by means of flexible conductors 6. The bus bar 5



extends around the tank near the top thereof so as to afford the shortest possible connections between the cathodes and the bus bar.

7 is a plate support, of conducting material, which is supported on blocks or strips 8 of non-conducting material on the ends of the tank 1, and 9 is a plate to be etched, which is suspended in the electrolyte from the plate support by means of a conductor 10. 11 and 12 are looped bus bars running parallel with a tank or series of tanks, and which are connected to the positive and negative poles respectively, of a suitable source of electricity. These bus bars 11 and 12 are connected to conductors 7 and the bus bars 5 of the different tanks by means of insulated conductors 13, 13a and 14, 14a, respectively.

As a low voltage current is usually employed in apparatus of this kind, and as an even distribution of the volume is essential, one of the legs of the looped bus bar 11 is connected to the conductor or support 7 at one end of the apparatus, and the support 7 connected at the other end of the apparatus to the other leg of the looped bus bar 11. The connections between the looped bus bar 12 and the cathode bus bar 5 is made in the same manner as the connections between the conductor or plate support 7, so as to provide an even distribution of the current throughout the tank, and avoid any difference of potential at the different points of connection.

As an electrolyte sodium chloride in water is used to a strength testing from 5 Baumé (heavy hydrometer) to saturation, to which is added from 5 per cent. to 10 per cent. of the volume of the former, of a solution of perchloride of iron of about 40 deg., or chloride of iron of equivalent strength, or the equivalent in dry chloride of iron, with or without the addition of nitric, hydrochloric, chromic, citric, or acetic acid, or any other suitable acid.

These acids increase the conductivity of the solution, which also varies with the strength of chloride solution. The acids also serve to keep the face of the anode clean.

In carrying out the invention the metal plate is first coated with a film which is sensitive to light. The film is then photographed, after which it is developed and thoroughly washed and dried. In some cases, owing to the character of the metal and the electrolyte to be subsequently used, it is advisable to immerse the washed plate in a hardening solution.

After the plate and film have been thoroughly dried, the plate is heated to a sufficiently high temperature to bake or enamel the photographed image on the metal plate. The back of the plate is then coated with an insulating material, and the plate is then placed in the electrolyte in the etching tank 1 and suspended in a horizontal manner as indicated at 9 from the conductor or support 7 by means of the conductor 10.

The plate is then etched by passing current through it as from the anode to the cathodes through the electrolyte so as to carry away metal from the plate. After the current has passed through the plate or plates, a sufficient length of time, the plate is removed and a proof is made, and if it is found that the plate has not been etched sufficiently, the proofing ink can be cleaned from the plate and the plate can then be further etched electrically or by hand.

As the image has been enamelled or baked on the metal, the image will not be affected by either the electrolyte, ink, ink-removing fluids, or the fluid used in the hand etching, so that the image is maintained in a perfect condition throughout the entire process of making the etched plate.

In some cases it is desirable, after the initial electrical etching, or after the first bite, to stop out the further etching of some portions and further etch other portions. This can also be done on plates made by the process by covering the portions to be stopped with shellac dissolved in alcohol or other suitable resistant material, which will prevent further etching of the covered portion, and after etching the covering can be removed without injury to the image.

Patent News.

Process patents—applications and specifications—are treated in "Photo Mechanical Notes."

Applications, April 24 to 29 :—

Films.—No. 11,473. Photographic films. J. E. Brandenberger.

Dark Slides.—No. 12,054. Photographic dark-slides. J. H. Campbell and J. Mackenzie.

Printing Apparatus.—No. 11,516. Apparatus for printing photographic papers from negatives. H. E. Jeffries.

Passe-Partout Bindings.—No. 11,713. Passe-partout edge bindings. I. Joseph.

Film Cartridges.—No. 11,699. Photographic film cartridges and protective leading strips or backings therefor. Kodak, Ltd.

Camera Stands.—No. 12,095. Camera stands. T. Peacock.

Daylight Development.—No. 11,520. Apparatus for daylight developing photographic roll films. J. Welch.

Aerial Cameras.—No. 12,018. Cameras for aerial, etc., photography. H. D. Watton.

Apparatus.—No. 11,679. Photographic apparatus. A. L. Waddell.

Stereoscopic Cinematography.—No. 11,960. Means for giving a stereoscopic effect to cinema pictures. M. Steinman Bezencenet.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

Quartz Soft Focus Lenses.—No. 177,720 (April 21, 1921). The invention consists in providing in a photographic camera or projecting apparatus a lens of quartz interposed alone in the path

of the light-beam from the object to the image receiving surface, whereby photographic soft focus effects are produced.

It has been proposed to use a lens of fused quartz as a component of a compound objective, the object being to have the component lens of low refractive index and great durability, but the capability of a quartz lens alone by itself—that is not combined with other lenses—of producing soft-focus effects with rapidity of exposure, and the practical application of this capability to photographic and projecting apparatus, are the discovery and invention of the present inventor.

In the production of soft-focus effects advantage is taken of the wide range of rays transmitted by such a lens and the resulting light-dispersion; or, in other words, rays of different wave lengths in the beam are projected to correspondingly different foci. An uncorrected lens of quartz—particularly a lens of one unit only—because it does not bring light-rays of different wave lengths to a focus at the same point, greatly increases the chromatic diffusion as compared with a lens made of glass. This produces a sufficiency of definition without blurring and with that amount of softness which permits of broad modelling a result which can never be the product of microscopic definition.

Quartz also possesses the great advantage of transparency to the ultra-violet rays down to about 185 $\mu\mu$, whereas most varieties of glass absorb in large degree that part of the spectrum of shorter wave length than the visible violet rays, about 390 $\mu\mu$. These ultra-violet rays affect chemical reaction, particularly that produced by light on a photographic plate to a much greater extent than the rays of visible light, and, therefore, the quartz lens show a great increase in rapidity as compared with a lens made of any of the optical glasses in common use. Comparative tests prove that this rapidity—(that is, the speed with which the photographic plate is reacted upon)—reaches five times that of glass lenses used for similar photographic purposes. Because rays of great intensity are transmitted which do not pass through glass at all, it is possible to get photographs in comparatively dull daylight—such as that from windows in an ordinary room or in deeply shaded woods or forests—with a rapidity of one-sixteenth of a second.

It is preferred to make the quartz lens by grinding the material to meniscus form, and the material may be fused quartz which can now be produced for optical purposes free from strain. As compared with a similar lens of glass, the quartz lens exhibits a marked difference in the variation of focus between the visible image and the actinic image recorded on the plate. In the case of the glass lens, this difference amounts to as much as one-fortieth of the focal length. In the case of the quartz lens it is only about one-four-hundredth of the focal length. This is insufficient to make any real difference in focussing necessary.

In using the meniscus quartz lens in the camera, the convex surface should be turned toward the plate, the diaphragm should be well in advance of the lens, and a lens shade should be employed—especially if the lens is worked at full aperture.

As an example of one of the soft focus lenses described in the application, there is used in one instance a lens 2-in. diameter, radius of curvature of the concave surface $6\frac{1}{2}$ in.; radius of curvature of convex surface, $4\frac{1}{4}$ in.; lens 1·5 in. thick at edge, and placed $1\frac{5}{8}$ in. behind the iris diaphragm which has a maximum opening of $1\frac{1}{2}$ in.—W. J. Mellersh-Jackson, 28, Southampton Buildings, London, W.C.2, for Hanovia Chemical and Manufacturing Co., Chestnut Street and New Jersey Railroad Avenue, Newark, United States.

The following complete specifications are open to public inspection before acceptance:—

Print-Out Papers.—No. 178,828. Photographic print-out papers and prints made therefrom. J. A. Johnson.

Apparatus.—No. 178,853. Apparatus for coating with a protective layer photographic or like films. H. Lichte.

Reproducing Sound Waves.—No. 178,805. Process and means for the production of sound-wave photograms. R. Mylo.

Trade Names and Marks.

MARKS PLACED ON THE REGISTER.

The following marks have been placed on the register:—

Weeks Electrical Etching (Design).—No. 420,180. Electrical etching machines. Weeks Photo-Engraving Co., Incorporated, 923, Sansom Street, Philadelphia, Pennsylvania, U.S.A., photo-engravers and manufacturers of electrical etching machinery.

Velox (Four Designs).—No. 421,045. Photographic papers. Kodak, Ltd., Kodak House, Kingsway, London, W.C.2, dealers in photographic materials.

New Books.

The Barnet Book of Photography.—The instruction manual of Messrs. Elliott's was a work which passed through successive editions before the war and achieved wide popularity from the practical character of its contents and the attractive production of the book. In issuing, after unavoidable delay, a new edition, Messrs. Elliott have preserved these two features and have produced a handsome volume composed of a series of thirteen chapters by well-known photographic writers on various branches of photographic work. Mr. W. L. F. Wastell, who has edited the volume, leads off with a paper on negative making, dealing in a plain and straightforward manner with the development, fixing and after-treatment of plates in accordance with the current practice. Orthochromatic photography is in the hands of G. T. Harris, a reproduction of one of whose photographs is a particularly fine example of the skilful use of an orthochromatic plate. The printing processes occupy several chapters; gaslight by the late C. H. Hewitt; P.O.P. and self-toning by H. W. Bennett; bromide by C. W. Somerville; bromoil by J. A. Sinclair; lantern-slides by James Shaw and enlarging by F. J. Mortimer. What may be termed particular branches of photographic work are represented by articles on home portraiture by W. Harold House, architectural photography by Ernest Marriage, on high-speed photography by Adolphe Abrahams and on reflex cameras by G. E. Brown. The book is most attractively printed and bound and externally recommends itself to the amateur photographer, who will not be disappointed by the good fare within. The price of the new edition is 3s. net.

Eyes and Spectacles.—A translation of the work by Dr. M. von Rohr has been made by Mr. A. Harold Levy and published, price 6s. net, by the Hatton Press, 123, Fleet Street, London, E.C.4. Although written for the information of those engaged in visual optics, and particularly in the spectacle-making trade, the first chapter is an account of the properties of the eye in respect to vision, such as cannot be found expressed in a similarly precise and simple manner in the lesser optical text-books. For the sake of this chapter alone and its simple treatment of properties such as sharpness of vision, accommodation, perspective, and binocular vision, which have their application in the making of photographs, the volume thoroughly deserves a place in the library of those interested in photographic optics. Mr. Levy has not had the easiest task in making the translation, as those who have undertaken the work of translating Dr. von Rohr's highly condensed and idiomatic German will know, but with the assistance of the German author he has made what appears to be throughout an English rendering exceedingly close to the original.

Reports of Applied Chemistry.—The sixth volume of the series of reports on the progress of various branches of chemical industry, which is compiled each year by the Society of Chemical Industry, has again appeared under the editorship of Mr. T. F. Burton. It is published by the Society, 46-47, Finsbury Square, London, E.C.2, price 12s. 6d. Members of the Society obtain it for 7s. 6d. There is scarcely a branch of the chemical and metallurgical manufacturing trades, the progress of which during 1921 is not reviewed in these pages in the shape of a very readable report which draws together the threads of research and presents the advancements which have been made in a form in which a chemist whose specialty is in another field may readily appreciate them. Photographic materials and processes have formed a section of the work from its

nception. The report in the current volume is by Mr. F. F. Renwick and is a very able review of progress in invention and manufacture as disclosed by recent published literature and patent specifications.

PHOTOGRAPHY IN COLOURS.—As we go to press we have received a copy of the new edition of "Photography in Colours," by Dr. Lindsay Johnson, just issued, with revisions and additions, by Messrs. Routledge. The price is 7s. 6d net, not 6s. net as provisionally announced. A review of the work will appear in an early issue.

New Apparatus.

CORRUGATED ZINC.—Mr. A. E. Bawtree, 7, Manor Park Road Sutton, Surrey, sends us a specimen of the corrugated zinc grooving which he is placing on the market for use in the fitting of lantern-slide boxes, drying racks, plate washers, negative storage boxes and similar purposes. There is no doubt that there is a considerable demand for this material among photographers fitting up their own appliances of one kind or another. Mr. Bawtree supplies the zinc at the rate of 1d. per 5 grooves, carriage paid. Thus a strip of 50 grooves costs 10d.; it measures 10 ins. The grooving is 1¼ in. in width.

DESIGNATION MASKS.—Mr. A. W. Bowen, The Laurels, Arkley, Barnet, who for many years past has made a specialty of the supply of masks, title strips, etc., for use in printing from photographic negatives, sends us some samples of his latest masks, containing the photographer's name and address, for printing under the portrait at the same time as the picture itself. The lettering in these masks is now printed on coated celluloid instead of on a transferred gelatine film as formerly. Also the lettering itself is much improved, and can be supplied in various styles. Mr. Bowen has a wide range of sizes, and can, in fact, supply anything in the way of a mask, which the photographer may want for insertion of his name and address into portraits, view postcards, etc. In postcard size, for printing a title or name and address on a white border simultaneously with the picture, the price of the mask is 1s. 3d.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, MAY 15.

Southampton C.C. "A Chat about Lenses." G. Chalk.

TUESDAY, MAY 16.

R.P.S. "Natural Colour Photography." J. F. Shepherd. A Demonstration of Fallowfield's "Translucent Screen" Outfit.
Bournemouth Camera Club. Photographic Jumble Sale.
Cambridge Phot. Club. "Photograms of the Year" originals.
Hackney P.S. Photographic Apparatus. A. Dordan Pyke.

WEDNESDAY, MAY 17.

Croydon Camera Club. "Shaw, Shakespeare and Cæsar." Cavendish Morton.
Dennistoun Amateur P.A. Impressions of Outing.
Rochdale Amateur P.S. "Experiment with Liver of Sulphur Toning." W. Lord.

THURSDAY, MAY 18.

Hammersmith Hampshire House P.S. "Iron Salts in Photography." G. Hawkings.

SATURDAY, MAY 20.

Bradford Phot. Soc. Outing to Bolton Abbey.
Edge Hill Camera Club. Outing—Halewood and Gateacre
Sheffield Phot. Soc. Outing to Rivelin Valley.
Southampton Camera Club. Outing to Ocknell Pond.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held on Tuesday, May 9 at the house of the Royal Society of Arts, Mr. W. L. F. Wastell, president, in the chair.

The third Hurter and Driffield memorial-lecture was delivered by Professor The Svedberg of Stockholm, who took for his subject "The Interpretation of Light Sensitivity in Photography."

He first briefly referred to the much discussed theme of recent photo-chemistry, viz., the validity of Einstein's law of the photochemical equivalent in cases of change in a substance by exposure to light. The experimental evidence was conflicting. Some reactions were in fair accordance with the law; in others the yield is greatly in excess of the theoretical. Secondary reactions appeared to provide the explanation.

Passing to the problem of an emulsion of silver bromide, Professor Svedberg distinguished between the sensitiveness of a plate, the sensitiveness of the individual grains of silver halide and the sensitiveness of the material of those grains. The first depended on the number of grains per unit area, their size and distribution and the sensitivity of the material composing them.

As regards sensitiveness of grains, the experimental evidence favoured the view that a grain was rendered completely developable or left undevelopable by exposure to light. But grain sensitiveness, so far as it possessed experimental significance, meant the percentage number of grains made developable by a certain exposure. It was an average, not a property of an individual grain. There was undoubtedly a relation between sensitiveness and size of grain—the larger grains being always more sensitive than the smaller ones—but later on in his lecture Professor Svedberg expressed the view that greater sensitiveness was compatible with a smaller size of grain.

How he asked, was it possible to account for the fact that there seemed no reason why a large grain was more sensitive than a smaller one, i.e., became developable by a lesser exposure? He had been able to throw some light on this subject by observing that development started at certain points within the grain. One such starting-point made a grain developable. The number of starting-points in a grain appeared to follow the laws of chance, and thus larger grains were (on the average) more sensitive than smaller ones, because of the greater probability of their containing one starting point or more than one. He had, moreover, found that the surface area, not the volume, is the measure of "size" which determines the percentage number of developable grains.

Passing from considerations of this kind, he defined the sensitiveness of the material (silver halide) of the grain as measured by the average number of developable centres per unit area of grain surface. In these terms the sensitiveness of the essential material of an emulsion could be expressed independently of the sizes of the grains. In emulsion making the aim was to get small grains of high sensitiveness, an aim which was not inconsistent with his researches.

Professor Svedberg's lecture was listened to with the greatest interest by an audience which should have been larger. On the proposition of Mr. W. B. Ferguson, K.C., seconded by Dr. T. Slater Price, the thanks of the Society were accorded to Dr. Svedberg, and a replica of the Hurter and Driffield medal presented to him as a memento of the occasion.

CROYDON CAMERA CLUB.

Richard was himself again in the person of Mr. A. Dordan Pyke with a lantern lecture on "Home Portraiture." His last failed to come up to his usual standard, from circumstances, it has now transpired, not under his control.

It is therefore a pleasure to record that Mr. Pyke last week scored well with an amusing and instructive theme. Tonic also, as opening up almost unlimited possibilities of varied work at home. Some realistic natural history studies, due to Mr. Wilkinson, came first, which even Mr. Martin Duncan might envy. These were followed by delightful portraits of children, and animal, insect and genre studies taken by Johnson's flashlight.

The flash proved to be quick enough to record no reflex movement, even of cats, in relation to rapidity of combustion. A spider, too, came out distinctly in all details, though no trace of the sitter could be found after the exposure. Luckily this was a free sitting.

An interesting point was incidentally raised by Mr. Pyke as to whether the spirits of deceased pets re-visit this mundane sphere. He was inclined to this opinion by being awakened one night by the singing (sic) of a cat whose voice strikingly resembled that of a departed pet. This he proceeded for hours, despite unappreciative remarks which fell from the window. Without wishing to cast doubts on the existence of spook cats, the only presumption

arising out of the incident appears to be that Mr. Pyke used language befitting the occasion.

"Table-top" photography, which brought the evening to a close, was excellent, especially those slides which included humorous and cleverly modelled plasticine figures by the lecturer's wife. Some of them fairly revived the jaded photographic appetite of the old stager. Mention should also be made of some effective "Celophane" coloured films for firelight and moonlight studies. No one, including the lecturer, knew where they are to be obtained.

In the discussion, Mr. Jobling, alluding to some striking views shown with natural clouds taken with a pale light-filter on Wellington's anti-screen plates, pointed out that without a filter they would always do more than an ordinary plate in the way of colour correction, and with a filter of light hue more than a yellow sensitive ortho' plate similarly screened, and with no sacrifice of speed. He had obtained a good representation of khaki on unscreened anti-screen plates. A hearty vote of thanks was accorded Mr. Pyke for a lecture which can confidently be recommended to photographic societies.

EDINBURGH SOCIETY OF PROFESSIONAL PHOTOGRAPHERS.

Meeting held on Monday, May 1. Present: Mrs. Mackay, Messrs. J. Campbell Harper, Norman Thomson, J. B. Johnston, Alex. Ayton, John Thomson, W. J. Hutcheson, Aikman, Fergusson, George Balmain, W. B. Hislop, Dakers, and E. D. Young. Mr. J. Campbell Harper, President, in the chair.

The Secretary read letters of resignation from the Society from Mr. William Halkett, Portobello, and Mr. Charles D. Crooke, Edinburgh, and these were accepted with regret.

The Treasurer submitted his accounts for the year 1921-22, from which it appeared that the balance at the credit of the Society amounted to £17 3s. 6d.

The accounts were gone over with the relative vouchers and approved and signed by the Chairman.

The election of office-bearers was then proceeded with. Mr. Hislop moved that Mr. J. Campbell Harper be re-appointed President for the next session. This was seconded by Mr. Fergusson, and cordially approved.

Mr. Campbell Harper, in returning thanks, said that he would do his best for the Society, and appreciated the confidence which the members reposed in him. Mr. George Balmain, Mr. Fergusson and Mr. Moffat were re-appointed members of the committee, and Mr. Fergusson moved that Mr. Norman Thomson be elected a members of committee in place of Mr. Coltart. This was seconded by Mr. E. D. Young. There being no other nominations, these gentlemen were appointed members of the committee. The President moved the re-election of Mr. A. Allan Lowson, Solicitor, Supreme Courts, as Secretary and Treasurer, which was unanimously agreed to.

Mr. E. D. Young moved that a cordial vote of thanks be given to Mr. George E. Brown, Editor of the "British Journal of Photography," for his kindness in publishing the minutes of the Society in his journal. This motion was heartily approved of, and the Secretary was directed to transmit to Mr. Brown an excerpt from this minute.

The Secretary read to the meeting Mr. W. B. Hislop's report on the photographic chemistry and optics class held last winter. Mr. Hislop stated that the attendance was excellent, and that the majority of the students showed a considerable amount of interest in the lectures, although the benefit they would derive therefrom was more in proportion to their previous education and training in photography. He thought the class was a success, but he was doubtful whether another year on the same lines would produce the same satisfactory results, as the effects of the class had been to increase the differences between the various grades of students. This was inevitable in a lecture course.

He suggested that if it could be arranged for the students to have some experimental work, it would enable the class to work on a more level footing, besides fixing the experiments in their minds. He also suggested if the students had the privilege of visiting three or four studios in town in order to become familiar with photographic appliances and lenses and their working, it would be of an immense advantage and an effective way of deepening their interest in their work. The President, on behalf of the members, thanked Mr. Hislop for his report, and assured him that there would be no difficulty in procuring apparatus for use of the students, and arranging for some studios in Edinburgh being opened to them. The President further stated that he could think of no one who was so eminently fitted to undertake the tuition of the class as Mr. Hislop, and hoped that he would agree to continue his good work for another year. Mr. Hislop, in reply, stated that he could not meantime agree to undertake the class for another year, but he was willing to afford his successor every assistance in his power. It was accordingly remitted to the President to call on Mr. McNally, of the Edinburgh Education Authority, and endeavour to come to some arrangement for the carrying on of the same.

Mr. E. D. Young, in moving that the constitution of the Society be altered, stated that the Society had been hampered from increasing its membership and extending its activities by the restricted area from which it could draw its members. He accordingly moved that the constitution of the Society be altered (1) by deleting in Rule 3 the words "in Edinburgh and District," and (2) by adding in Rule 7 after the words "First," "For members who carry on business within the City of Edinburgh, and for all other members 10s. 6d. per annum." This was seconded by Mr. Fergusson, and unanimously agreed to. Mr. Fergusson stated that in respect that the rules of the Society could only be altered at an annual general meeting in May, it was thought expedient, in view of the coming Congress and Fair, to have power to call an extraordinary general meeting of the Society for that purpose on the requisition of at least five members. He accordingly moved that in Rule 9 there be added after the words "general meeting" the words "or at an extraordinary general meeting of the Society for that purpose on the requisition of at least five members." This motion was seconded by Mr. George Balmain and unanimously approved.

The Secretary read to the meeting a postcard which had been handed to him by Mr. Hislop and Mr. Harold Hood, of Hood and Co., photo-engravers, Sandbride Works, Middlesbrough, requesting him to send a copy of the rules of the Edinburgh Society of Professional Photographers as they wish to form a similar society in that district. The President stated that it was very gratifying that similar societies to theirs were being started in other towns. The Secretary was instructed to send a copy of the rules, and to say that the President and members of committee would be pleased to afford them any assistance in the formation of their society.

The Secretary read a letter which he had received from the Secretary of the Glasgow and West of Scotland Society of Professional Photographers, dated April 7, giving their society's views that the formation of a Federation was, in their opinion, premature, and that in regard to the subject of the Congress they thought that the management and responsibility of it should be left entirely in the hands of the Edinburgh Society, although they would give the Congress their support. A map of Scotland was also enclosed suggesting that the country be divided between the two societies so that the Glasgow Society could solicit members from those on the west side of Scotland, and the Edinburgh Society from the east. In view of these findings the Glasgow Society did not consider it necessary for the proposed Conference to be held on April 21. The President stated that this letter had come to them somewhat in the nature of a surprise, as it was the impression of both Mr. Young and himself, who attended the Glasgow meeting on behalf of this Society, that the Glasgow Society were most anxious that the question of Federation should be proceeded with at once. He further stated that there were several questions which had been discussed with the Glasgow Committee, and which he had hoped to settle at a joint meeting,

These were (1) the drafting of a joint circular to be issued by both societies; (2) mutual agreement as to the boundaries; and (3) the question as to whether country members should have the option of joining either society. He had convened a meeting of the Committee to discuss the matter, and a reply was formulated to the Glasgow Society, in which it was stated that this Society had no desire to press the question of Federation immediately, but that the impression of Mr. Young and himself was that their Society wished that federation should precede that of the extension of the boundaries of the societies and the formation of societies in other towns. It was also pointed out that they had not replied to the above three questions which were under discussion at the meeting in Glasgow, and as the Edinburgh Society desired to act in unison with them it was suggested that a confe

ence be held to decide the questions. No reply had as yet been received to this letter.

The meeting thereafter considered the proposed division of the map, and after discussion came to the conclusion that the proposition was impracticable. It was felt that the question which society country members should join should be left entirely to themselves. Mr. J. B. Johnston accordingly moved that the proposed division line in regard to the allocation of towns be not agreed to, and that a friendly arrangement be come to with the Glasgow Society with regard to the issuing of circulars so as to avoid over-lapping. Mr. Hislop seconded the motion, and it was agreed to. The Secretary was requested to communicate this to the Secretary of the Glasgow Society.

The President read to the meeting a letter which he had received from Mr. Thomas Williamson, of the Edinburgh Exhibition Association, stating that the Association were erecting a large exhibition hall in Annandale Street, which he thought would be suitable for the Congress and Fair. The President reported that Mr. Young and he had an interview with Mr. Williamson, who stated that he could provide a lecture hall, exhibition hall, stalls for manufacturers and dealers, and also a band. His charge for stalls was 4s. 6d. per foot, including skeleton stand and roof. The hall would be lighted, but separate lighting would be provided at schedule rate. Mr. Williamson suggested that the best time of year for holding the Congress and Fair would be the last week in March. It was agreed that the Society should not commit itself in any way until it was ascertained how far the manufacturers and photographic dealers would support the exhibition by taking stalls. It was arranged to convene a meeting of the committee for Wednesday evening, the 10th inst., to frame a letter to the manufacturers and dealers inquiring if they would give their support to the proposed project.

Mr. Young intimated that he had written the board of directors of the College of Art asking for the use of their hall for an exhibition of American portraiture which was presently being exhibited in London. This was approved of by the Society. It was resolved to make every endeavour to secure the exhibition for Edinburgh for one week.

A hearty vote of thanks was moved to the President and members of committee and the Secretary for their services during the past year.

A vote of thanks to the Chairman concluded the business.

Commercial & Legal Intelligence.

Legal Notices.—Notice is given that general meetings of the members of the Precision Lens Moulding Co., Ltd. (in liquidation), the Crescent Lens Co., Ltd. (in liquidation), and the Guaranteed Lens Co., Ltd. (in liquidation) will be held on June 2, at 2-3, Duke Street, St. James', S.W.1, for the purpose of considering the liquidator's reports, showing the manner in which the windings-up have been conducted, and the properties of the companies disposed of.

Notice is given of the dissolution of the partnership between Edward Lincoln Airey and Leighton Airey, carrying on business as fine art dealers and picture-frame manufacturers at 11-13, Railway Road, Blackburn, and 10, Hargreaves Street, Burnley, under the style of Edward L. Airey & Son. All debts due to and owing by the late firm will be received and paid by Mr. E. L. Airey, who will continue to carry on the business at Blackburn under the same style.

NEW COMPANIES.

Photo. Printing Paper Co., Ltd. This private company was registered on May 1. Capital £500 in £1 shares. Objects: To acquire the business of drawing office stationers and printers carried on as the "Photo. Printing Paper Co.," by V. Niox, of 61, Marsham Street, Westminster, and to carry on the same and the business of photo. printers, mounters, lithographers, printers and dealers in sensitised papers and other materials, etc. The subscribers (each with one share) are: V. Niox, 61, Marsham Street, Westminster, S.W., photo. printer; L. Compender, 11, Ferndale Road, Clapham, S.W.4, book-keeper. V. Niox is permanent director and chairman. Remuneration: As fixed by the company.

Moons Stereoscopic Pictures, Ltd.—This private company was registered on May 1 with a capital of £12,500 in £1 shares. Objects: To acquire an invention in connection with concave screens and other means for taking and projecting a stereoscopically cinematograph picture, etc. The first directors are: S. H. Moon (managing director), 51, Park Road, Moseley, Birmingham; H. H. Moon, Bristol Road, Birmingham; J. Payton, 14, Lightwoods Hill, Warley, Birmingham; and E. S. Lermit, 34, Lightwoods Hill, Warley Birmingham. Qualification: 100 shares. Remuneration as fixed by the company. Registered office: 10 and 12, Holloway Road, Birmingham.

News and Notes.

The Club Photographer.—We understand that Dr. R. T. J. Glover has resigned from the technical editorship of the "Club Photographer," which he has held since the first issue of our Liverpool society contemporary.

A Photographic "Barrieism."—Sir J. M. Barrie said in his Rectorial Address at St. Andrews last Wednesday: "Don't put your photograph at all ages in your autobiography. Photographs give away what you have done with your life."

Films by Wireless.—That cinematograph pictures will be transmitted ere long by radio was declared to be probable by Mr. L. C. Porter, President of the Society of Motion Picture Engineers, in his address to the convention of that society at Boston, U.S.A.

The Art and Practice of Photography.—This excellent little manual by Mr. W. Bell, of the Criterion Co., which we reviewed some months ago, has now been issued in a second edition, which will be on sale at bookstalls, newsagents, and photographic dealers, price 6d. Anyone unable to obtain it from these sources may receive a copy by remitting 8d. in stamps to Messrs. Criterion, Ltd., Stechford, Birmingham.

Automatic Printing Exposure Timer.—In his "Paris Notes" a month or two ago M. Clerc referred to the very ingenious appliance of MM. Godefroy, of Paris, for automatically giving any particular exposure (and repeating this as often as required) in the use of a printing machine or in fact of any electric light. The appliance is now obtainable in this country from the Anglo-French Photography Co., 49, New Kent Road, London, S.E.1, who supply it, delivered free in the United Kingdom at the price of £4 10s.

Mr. Robert Ballantine, 103½, St. Vincent Street, Glasgow, sends us a 40 page price list of secondhand photographic apparatus and general sundries, in issuing which he makes special mention of the fact that every item has been purchased, tested, and examined by him personally, and that, therefore, he can give his personal guarantee of the satisfactory working condition of the goods. The price list specifies a large number of hand and stand cameras, lenses and enlargers, and is obtainable free on addressing a postcard.

Albumen Paper.—A correspondent writes: "It is often stated in the Press and by dealers that albumen paper is now off the market and is never likely to appear again. During my visit to the Photographic Fair last week I made several inquiries concerning it. I found that the paper is being made to-day by the Autotype Co., 73, New Oxford Street, London, W.C.1, and this fact may be of interest to many of your readers who have perhaps failed to trace the source of modern supplies. There is, I understand, a steady demand for it, mainly, I suppose, for crystoleum work."

Lancashire Society of Master Photographers.—The fourth annual conference will be held on Wednesday and Thursday next, May 17 and 18, at the Palatine Hotel, Blackpool. Mr. Swan Watson and Mr. Alfred Ellis, president and secretary of the P.P.A., have accepted invitations to be present. Lectures will be delivered by Mr. C. P. Crowther and by Miss Fleming, of Nottingham, the latter on the photography of children. It is hoped that there will be a full attendance of professional photographers in the North of England. All particulars are obtainable from the secretary, Mr. W. H. Hush, 39, Brickfields, Manchester.

Counting Seconds.—Although many dodges for counting seconds accurately have been advocated, photographers know how very easily one may be deceived when working without a watch. Remarking that it was extremely difficult to measure time, the Recorder (Sir Ernest Wild, K.C.) conducted an experiment at the Old Bailey during the hearing of a case last week. A witness had stated that two minutes had elapsed between certain events, but, asked to indicate that time by the words "Go" and "Now" while

counsel checked the seconds with his watch, it was found that forty-five seconds only had passed.

PHOTOGRAPHING MOUNT EVEREST.—The writer of the "Diary of a Man about Town" in the "Evening News" states that Captain J. Noel, F.R.G.S., commanding the photographic section of the Mount Everest Expedition, had a narrow escape while travelling on the Darjeeling-Himalayan Railway. In order to take a quickly-moving picture he had climbed on the roof of the car and was nearly swept off his perch several times while passing under low bridges and overhanging foliage. "He writes home," continues the Diarist, "glowing accounts of what can be done with the Newman-Sinclair cine camera, which appears to be able to do everything but talk the Tibetan language. By using the new motor attachment the camera can be left to take something like 2,000 feet of film all by itself!"

NEWSPAPERS BY PHOTOGRAPHY.—Newspapers by photography are no new thing (writes a correspondent), and many will remember the excellent issues of "The Scientific American" produced entirely by photography a year or so ago, but the photographic edition of the Paris "Daily Mail" may not be so well known. This photographic feat was referred to by Lord Northcliffe in a speech made last Thursday when presenting a gift of £10,000 and £2,500 pension to one of his retiring editors. "The editor of the Continental edition of the 'Daily Mail,'" said Lord Northcliffe, "was, without warning, one night faced with a telephone threat from a number of misguided workers, who at the same time telephoned to the editor of the Paris edition of the 'New York Herald' and combined in a lightning strike. Mr. Goudie (the editor) accepted the challenge, and in a few days produced an almost perfect newspaper by photography. In a fortnight it was difficult to see that it was not a newspaper produced in the usual way from type."

TORONTO CAMERA CLUB.—The thirty-first annual exhibition arranged by the Toronto Camera Club will again form part of the Canadian National Exhibition at Toronto, from August 26 to September 9 next. One of the largest exhibition galleries in the building of applied arts has been placed at the Club's disposal, and will allow of the hanging of upwards of 600 prints. Our Canadian friends hope to receive many exhibits from the mother country. An entry form is obtainable from the Secretary of the Committee, Mr. J. H. Mackay, 2, Gould Street, Toronto, but as little time elapses between now and the final date for the receipt of entries, namely, July 22, no doubt exhibits will be accepted without the accompaniment of the official entry form. The number of works which may be sent by a single exhibitor is limited to eight, an entry fee of 50 cents covering this number. Exhibitors are asked to state the title of each picture, the process used for the print, and also whether the exhibition committee has the exhibitor's permission to allow prints to be reproduced. Exhibits should be sent by post only, and should be declared as for exhibition only and without commercial value. Prints must be mounted, preferably on white or light tone mounts, 16, 20 or 24 inches in height, but not framed.

R.P.S. AFFILIATION OUTING.—The organising societies, for the outing on May 27 are the Hitchin and District Camera Club and the Letchworth and District Camera Club. The route to be traversed is from Hitchin Station, through Charlton, Well-head, Gosmore, and St. Ippollitts back to Hitchin.

Tea will be served at 4.30 p.m. at the Brand Street School Room, after which visitors will have ample time to photograph in the town itself, permission having been obtained to photograph in several interesting buildings.

Arrangements have been made with the G.N. Rly. Co. whereby a party of twelve or more travelling to Hitchin together by any train may do so at a reduced return fare of single fare and a third. For those travelling from King's Cross, special tickets will be issued at 6s. 3d. return, and the party from King's Cross are advised to use the following services :—

King's Cross depart, 1.5 p.m.; Hitchin arrive, 2.16 p.m.

Return :

Hitchin depart, 8.56 p.m.; King's Cross arrive, 10.8 p.m.

Additional trains :

King's Cross depart,	9.20 a.m.	; Hitchin arrive,			10.21 a.m.
,, ,, ,,	11.30 a.m.	,,	,,		12.22 p.m.
,, ,, ,,	12.40 p.m.	,,	,,		1.31 p.m.
,, ,, ,,	1.45 p.m.	,,	,,		2.47 p.m.
,, ,, ,,	2.30 p.m.	,,	,,		3.31 p.m.

Those travelling from King's Cross must apply through their Secretary for tea and railway (special) ticket to Mr. Cannon (address below), while those travelling from other stations, providing the party numbers not less than twelve, should apply to their Station Master beforehand for terms.

Members not using the trains advised should let Mr. Cannon know what train they intend travelling by.

Admittance to the tea will be by ticket (2s. 6d.), and applications for tickets must reach Reg. Cannon, 16, Ickleford Road, Hitchin, with remittance from the Secretary of each Society, *before* May 21, otherwise tea cannot be guaranteed.

Members of the organising societies, wearing black and amber ribbons, will be stationed at points along the route to give any required information or guidance, and will meet parties arriving by train.

Entries for the usual affiliation outing competition will only be accepted from those who sign the attendance book at tea time, and the usual competition rules of the Affiliation Board of Judges will be adhered to. Further particulars may be obtained from Secretaries of affiliated societies, or from the official Red Book of the Affiliation.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

INVENTIONS IN COLOUR PHOTOGRAPHY.

To the Editors.

Gentlemen,—In view of the fact that I believe the statements which I made in my previous letters were substantially and in effect quite true, and that only an evasion or perversion of the facts can make them appear otherwise, I am sorry that Mr. Wall, by his communication which appears on page 206, makes it necessary for me to write again.

To begin with, I have tried to make it clear that my object was to produce *extremely tenuous* colourless colloid reliefs, which were subsequently dyed in various colours. I made such relief prints which could be completely dyed up with some of the well-known soluble acid dyes in about 30 seconds, producing colour prints as perfect in every respect as relief prints which would require from 10 minutes to half an hour to dye through evenly with the same dye solutions, and which in a further development and application of the process permitted of making imbibition prints on such hard surfaces as Velox backing paper, with short time contact and entire absence of the dye spreading action which characterised all imbibition prints as previously made, on soft gelatine paper, with the long contact made necessary by the reliefs used by Sanger Shepherd and others. This accomplishment positively had not been anticipated by others.

In the perfecting of this substantially new and really revolutionary procedure I introduced an entirely new and original system of dye bath control, whereby any number of exactly duplicate prints could be made automatically and rapidly, the depth of dyeing depending upon the dye bath composition, and being independent of time of immersion after a certain short period. I well remember how a former pupil of Mr. Wall's, who was employed as my assistant, thought that the way to get a lighter print was to dilute the dye bath with water, and was thunderstruck to find that the composition, and not the strength of the dye bath, was what determined the depth of colour in the print.

Mr. Wall discounts all this by two references to procedures which did not effect these results, and declares in effect that there was no originality in my methods.

Now, as to the facts: Lumière specified the addition of cochineal red to the bichromated colloid coating. Cochineal red is very transparent to the blue and violet light to which bichromated colloids are most sensitive, and while it could conceivably, and probably did, have some restraining effect, it could not serve for the production of "extremely tenuous relief prints." The colour which Lumière

added was not, with respect to bichromated colloid, a true "non-actinic colour," such as specified in my patent, and it is not true that Lumière anticipated that patent.

Mr. Wall now for the first time quotes from a British Sanger-Shepherd Bartlett patent: "It is desirable to add a colouring matter, or preferably bromide of silver, to the gelatine solution." I had never seen this reference, the mention of the colouring matter being omitted in the U.S. patent; but, from my point of view, it is sufficient to know that Sanger Shepherd was not seeking to produce such extremely tennous relief prints as I did, and that he could not have done so if, as stated, he preferred the results obtained with bromide of silver in an uncoloured film. He certainly did not specify the use of a water-soluble yellow dye as used and patented by me. A specific accomplishment which is in effect revolutionary is not anticipated in patent law by steps in the same direction which fall short of the specified accomplishment.

I therefore repeat that Lumière did not anticipate me by ten years, or Shepherd and Bartlett by eight years.

With respect to Mr. Wall's remark that in my patent on Photochromoscope and Photochromoscope camera "there is not the slightest suggestion of a camera" "except" such as appear in title, preamble and claims, and the statement in the body of the specification that "by the use of suitable lenses and colour screens and the substitution of plate holders for the chromogram holders, either form of the instrument may be adapted for making the chromogram negatives," etc., I ask, what more can any reasonable man demand in proof that it was an optical system designed, adapted, and patented for both a viewing instrument and a camera?

Mr. Wall accuses me of trying to be plaintiff, defendant, and judge all at the same time, and says that my statement that the "White" camera infringes my patent carries no weight at all. A statement of fact by an honest man should carry some weight, especially when references are given by which it can be verified. Mr. Wall could have quoted from my U.S. patent claims features which were incorporated in the "White" camera. For instance, claim 9, as follows: "A photochromoscope having a transparent mirror located therein at an angle, so as to reflect and also transmit rays of light, said mirror being so coloured that it will absorb unreflected rays of a character which the mirror is designed to reflect, but transmit rays of the character which the mirror is designed to transmit." Mr. Wall's statement that my attitude in this matter is "curiously unfortunate" is uncalled for. He knows very well that the so-called White camera is merely an insignificant modification of my own, making it no better as a camera, and distinctly less convenient as a viewing instrument.

Mr. Wall's statement that "Mr. Ives was again anticipated by Cros and Du Hauron in this type of instrument" may be taken for what it is worth. The matter has been thoroughly threshed out in the past, and I believe I have always given credit due to others, and claimed only what was my own. The validity of my patents, now expired, was never seriously questioned.—Very truly yours,

F. E. Ives.

1327, Spruce Street, Philadelphia
April 20.

SYSTEM IN HALF TONE OPERATING.

To the Editors.

Gentlemen,—It is interesting to see the above subject crop up for discussion once more, as the general opinion seems to be that the whole business had been thrashed out in the early days and that no more was to be learned in the matter. However, as most of your correspondents seem to agree, the average operator still works by "rule of thumb" method; and if one is to be guided by articles in past numbers of Penrose's Annual, most of them have occasionally obtained perfect negatives, and, while realising that if the exact conditions could be repeated the same result could be gained, have been unable to repeat the performance at will.

In actual practice with both wet and dry plates I have found it necessary to use a much wider screen distance for the 100-line and coarser screen rulings than that given by the mathematical calculations of the Smith-Turner system for when using the latter distances the high-light dots are decidedly round, and will not join at the corners. If we presume that working exactly to the system a perfect negative can be obtained with a 175-line screen, each coarser ruling down to 50-line must be proportionately farther from an ideal dot formation.

In Mr. Bierman's first article he states that:—"There is no theoretical reason why a dry-plate screen negative should not be perfect when it leaves the fixing bath." It would be interesting to know if Mr. Bierman means "capable of giving a perfect print on metal," for in an earlier system of his published in the Imperial Process Plate Handbook, the resulting negatives, from a flat bromide, for instance, with their excessive "penumbra" which partly prints through, would certainly not be judged perfect by a wet-plate operator used to seeing exactly what he has got in the way of actual dot formation.

Mr. L. H. Johnson's advice in your issue of May 5—"to be as exact as possible in applying the working hypothesis . . . that the ratio of screen distance is to screen ruling as the aperture is to camera extension" (which of course is the actual basis of the Smith Turner system), seems to fail for the reasons stated above, i.e., that one cannot be exact to system with the coarser screen rulings and obtain perfect results.—Yours faithfully,

F. B.

Birmingham, May 6.

To the Editors.

Gentlemen,—I am pleased to see Mr. Louis H. Johnson's letter, and to find the subject attracting attention from someone who evidently has some inside knowledge of the process trade.

I agree with most of what he says, but I cannot agree with all his conclusions. The keynote of his letter is, like the scorpion's sting, in the tail, and that is, that the normal distance equation is the last word, and so long as operators will accurately work to it all will be well. But that is exactly what I am attacking. There is a factor missing from the equation, and unless that factor is taken into account equivalent results with different screen rulings are impossible. The effect of blindly following the equation is to shorten the gradation scale with the fine as compared with the coarse rulings, and in the endeavour to overcome this the exposure is divided between several stops of different diameters, which cannot all agree with the equation, and the proportion of the exposure allotted to these stops must vary with different screen rulings. Therefore I contend that if the equation is scientifically correct this should not be necessary, and all screen rulings should render the same gradation with the same stop and exposure.

The effect of diffraction is no pet theory, but is the governing factor that is missing from the equation, and any advantage that can be gained from a study of it is certainly worth while. With regard to speed and quality that naturally follows if the system is right, but, where is the advantage in speed of negative production if the etcher is expected to correct faulty gradation?

If Mr. Johnson had any idea of the criticisms levelled at present-day half tone reproduction, and the efforts that are being made in many quarters to get away from its crudities he would probably think anything worth while that would help to put the process upon a more scientific basis. I agree with him that it does not end with the negative, but the whole process is about as "rule of thumb" as it can well be.—Yours faithfully,

E. A. Bierman, F.R.P.S.

AMERICAN PROFESSIONAL PORTRAITS.

To the Editors.

Gentlemen,—After reading Mr. Mackie's letter in your issue of May 5 I was not prepared for the great pleasure I experienced in seeing the American Portraits at the Photographic Fair.

There was a vitality about them, as a whole, which was quite extraordinary, and the fresh points of view and ease of nearly all the portraits made this part of the Fair an education in itself. Especially charming were the portraits of children, which were, in all cases, delightfully spontaneous. There was about this little exhibition a strong feeling that the authors are keen on their work and love it for itself.

Professional portraiture in England is, on the whole, of a much more conventional type, but then the English public is more conventional than the American, and I do not think that work such as this—much as I admire it—would find a ready sale in England

except among a few advanced members of the community. For most of us who earn our living by photography, I fear, the photograph that is "so clear" still finds the greatest favour among our clientèle.—Yours truly,

(Miss) VIOLET K. BLAIKLOCK.

18, Elsworthy Road, S. Hampstead, N.W.3.
May 6 1922.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

E. W.—Either of the shutters mentioned would give a much greater range of exposure and be more efficient than the roller blind, and are quite worth fitting. We advise you to entrust the work only to the makers of the lens.

J. A.—The copyright is certainly yours, and has been infringed definitely by the newspaper. You should write to the proprietors of the latter pointing out the infringement. They are the people, inasmuch as your customer apparently has not actually copied your photograph, but sent one of your prints to the newspaper.

S. W.—If the pinholes are very small they can be stopped out with a mixture of rubber solution and lamp black, applied as sparingly as possible with a fine camel hair brush. But the remedy is only temporary as a rule, and it is usually best to have a new blind fitted, which can be done by such a firm as Messrs. Peeling and Van Neck, 4-6, Holborn Circus, London, E.C.1.

H. J.—While-you-wait cameras are supplied by Messrs. Jonathan Fallowfield, 146, Charing Cross Road, London, W.C.2, who are agents for all the makes on the market. There is no book on the subject. An ordinary camera is unsuitable because means have to be provided for transferring the exposed metal plate or card in full daylight into a tank where it is simultaneously developed and fixed.

K M.—We do not know of any photographers who make a regular practice of selling negatives for retouching practice, but would advise you to apply to some of the professionals in your own neighbourhood. They might object to parting with them altogether, but might be willing to let you have some rejected poses on loan, to be returned when you have worked upon them.

C. G.—We are sorry that we cannot give formulæ for waterproof inks, as the makers keep these to themselves. Ordinary Indian ink becomes waterproof if mixed with a little bichromate of potash solution when mixing. We believe that some makers use a small quantity of a solution of shellac and borax in making their inks. The solution is made by mixing 1 oz. borax, 5 ozs. shellac in 20 ozs. hot water. Keep hot till dissolved, allow to cool and settle, and decant clear liquid.

U. F.—(1) Owing to the very high printing costs many photographic text books are out of print at present, but you can almost certainly get "Practical Lantern-Slide Making," by G. T. Harris, second-hand from Messrs. Foyle, 121-123, Charing Cross Road, W.C.2, for a shilling or two. (2) Demonstrations of lantern-slide making are frequent fixtures at photographic societies; probably there is one in the fixture list of the Wimbledon and District Camera Club, the secretary of which is Mr. F. J. Gittins, 39, Ashcombe Road, Wimbledon.

H. B.—The only two suggestions we can make for the improvement of the apparatus (which has little in common with that described by Mr. Lockett) are (1) to line the box containing the burners with a matt white coating, such as a matt enamel paint or white asbestos boards, and (2) to use one thickness of matt opal instead of ground glass. The former of these suggestions will give you a good deal more diffused light, and the opal will diffuse the light still more, though we are afraid it will lengthen exposures unduly. If these means are not satisfactory we are afraid that the only thing you can do is to fit a condenser.

J. D. T.—Yes, for distant scenery, particularly in regard to pictorial effect, there would be an advantage in fitting an adjustment so as to lengthen the focal length of your lens to, say, 16 ins. The extension of your half-plate camera would probably allow for the use of this focal length, perhaps a little more, say up to 18 ins. It is almost inevitable that the fitting of an attachment impairs slightly the definition of an anastigmat lens, but considering the relatively narrow angle over which the latter will be used we do not think that is very much to trouble about. Of course the F.No. (marked) will be increased in proportion to the new focal length.

M. E.—The photograph which you have taken, provided it was not taken to the order of the girl, is your copyright, and you can do what you like with it. We do not think that the fact that it bears a certain resemblance to the poster would be ground for action on the part of the company. Certainly there would be no case whatever as regards copyright for the suggestion that you were infringing their poster. On the other hand, if your enlargement is strikingly similar to the poster, there might very likely be strong objection on the part of the company on the ground that the use of the enlargement was leading the public to believe that the goods you are offering for sale are theirs.

E. M.—(1) Your present lens is a very old one, but the makers had a good reputation in their time, which was between 50 and 60 years ago. A modern lens of the same type by a good maker would most probably be superior, but would not compare with a good anastigmat. (2) As a rule it must be assumed that lenses by good makers are worth the price charged for them or the demand would not continue. It is impossible to establish a ratio between price and quality as the quality of the lens is not a measurable quantity. A lens that is only a little better than another may well be considered worth twice as much or even more. (3) The Aldis lenses offered by the Disposals Syndicate are certainly cheap, even after paying for an iris to be fitted, but it must not be forgotten that they were made to cover 5 x 4 plates. They may cover larger plates satisfactorily, but you must take the risk. You do not mention the size of plate you wish to cover nor the length of your studio. For general work, mainly cabinets, a 16-in. lens is a favourite for large studios, and a 10 to 12-in. for shorter rooms. A second-hand lens by a good maker is always worth nearly its cost for re-sale if you have not paid too much for it.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3237. Vol. LXIX. FRIDAY, MAY 19, 1922. Price Fourpence.

Contents.

SUMMARY.

In the King's Bench Division of the High Court, on May 9 and 10 last, before Mr. Justice Swift, the question of the rates chargeable by electric supply companies for current supplied to studios for purposes other than ordinary lighting was the subject of legal argument by counsel respectively representing the Westminster Electric Supply Corporation, Ltd., and Wykeham Studios, Ltd. Remarking that the case might raise important points in the supply of electricity, Mr. Justice Swift reserved his judgment. (P. 297.)

In the present chapter of the series of articles on the business side of professional photography, "Pelham Swinton" describes the organisation and use of a card index system for dealing with the execution and booking of orders in a portrait business. (P. 291.)

The first meeting of the committee appointed by the Board of Trade under the Safeguarding of Industries Act respecting the sale of German scientific goods in this country was held on Monday and Tuesday last. Evidence was given by Mr. Conrad Beck and by Mr. A. Dennis, of the Houghton-Butcher Manufacturing Co., among others. (P. 298.)

In a contributed article, Mr. B. R. Rawkins recommends a formula for the acid amidol developer suitable for bromide and gaslight papers, and gives directions for making it up in bulk. (P. 293.)

In a leading article we refer to a few of the practical points connected with the making of a stock of cloud negatives, particularly for use in printing-in on development papers. (P. 290.)

In his Paris Notes, M. L. P. Clerc discloses the method for the extra-sensitising of Autochrome plates worked out some few years ago by M. F. Monpillard. (P. 294.)

Experiments in the use of spent developers as desensitisers are described by Mr. J. G. F. Druce, M.Sc. (P. 296.)

Further particulars have been published of the Steigmann process for the simultaneous extraction of silver from used fixing baths and the regeneration of the hypo. (P. 289.)

A process for making reproductions of pictures on curved surfaces, such as vases, is the subject of a recent patent specification. (P. 299.)

Hungary and Brazil, having subscribed to the International Copyright Convention, the 1911 Copyright Act has been extended to Brazilian and Hungarian authors and works. (P. 300.)

In interior architectural photography advantage can very often be taken of the high view point obtainable by use of the lofty pair of steps available in many churches and cathedrals. (P. 290.)

In the use of a small hand camera on a tripod the wire-frame direct-vision finder is of great advantage in arranging the subject. (P. 290.)

EX CATHEDRA.

Charges for Electric Current.

The action brought by the Westminster Electric Supply Corporation, Ltd., against the Wykeham Studios, Ltd., in reference to the charge for electric current used in the latter's establishment for purposes other than ordinary lighting was heard in the King's Bench Division of the High Court on Tuesday and Wednesday in last week, May 9 and 10, before Mr. Justice Swift. As shown by the report of the hearing which appears upon another page, counsel for the plaintiffs and defendants agreed upon such matters particular to the case as the quantity of current consumed, thus making the action a clear test case respecting the right of an electric lighting company to determine the rates at which it should supply current for purposes other than ordinary lighting. After hearing the legal arguments advanced on both sides in interpretation of the Acts empowering electric light supply companies, Mr. Justice Swift reserved his judgment, and thus the issue of the dispute may not be available for some little time. As was represented by the plaintiffs' counsel, the judgment is likely to have far-reaching effects as regards the supply of current at "power rate" not only to photographic studios but to many other classes of consumers.

* * *

Hypo Recovery.

In the current issue of "Photographische Industrie," Herr A. Steigmann has an article which gives some further particulars of the process patented by him for the regeneration of fixing baths with simultaneous precipitation of the silver contained in them. As already pointed out in our issue of January 6 last, the substance which serves this double purpose is sodium hydrosulphite, which, according to Herr Steigmann, reacts with the double hyposulphite of silver and sodium in the fixing bath, throwing down the silver in the metallic state and producing a quantity of hypo equivalent to that previously combined with the silver, together with sulphur dioxide. It is now stated that the process takes place satisfactorily at the ordinary temperature, provided that a sufficient time is allowed. On the other hand, the hydrosulphite should be added as soon as the fixing bath has reached a state of exhaustion. If baths are allowed to accumulate for treatment together, other decompositions take place, resulting in the formation of silver sulphide, and thus interfering with the production of the silver in the metallic state and also with the re-use of the solution. Herr Steigmann estimates that the silver in ordinarily used fixing baths ranges from 3 to 4 gms. per litre, requiring about 6 gms. of hydrosulphite, or better 8 gms., and from 1 to 5 gms. of caustic soda. It is claimed that the solutions remain practically odourless during treatment, but it is not clear whether this is the case with fixing baths of the acid type, or whether the process is applicable to them without modi-

fication as regards the quantity of added alkali.. We cannot help thinking that while the method may be an excellent one for throwing down the silver, its value from the point of view of regenerating the hypo for use is rather doubtful, at any rate in the case of the acid or hardening fixing baths now so much in use.

* * *

View Point in Interior Work. A good many photographers, while fully alive to the importance of a view point in many branches of work, do not appreciate this fully in architectural interiors. Some time ago we were shown a fine photograph of the interior of a famous abbey, showing details from a point of view not generally attempted, the whole particularly well rendered from the point of view of perspective. Subsequent conversation elicited the fact that the photographer had fixed his camera to the top of an exceedingly high step ladder, such as is generally to be brought to light in these buildings by judicious treatment of the sacristan. Another advantage in this class of work, following from the higher point of view, is that objects not contributing to the beauty of the picture may thus be very conveniently dodged or subdued. We refer to stoves, chairs, and the hundred and one things that render difficult the making of a pictorial representation of interiors. The best way to fix the camera to the steps is to insert four sharp shoemaker's " awls " into the steps at the corners of the camera base. The exposures may be made from the ground, using an extra long release, or, if the shutter has a trigger release, a piece of thin string may be made to serve.

* * *

Photographing Altars. The photographer who attempts church interiors is often working under a difficulty when he has to photograph altars, the candles upon which are to be rendered burning. Even if the best of backed plates or the most non-halative film is employed in such circumstances the flames of the candles are represented as large circular blobs of whiteness, due to the irradiation of the emulsion. There is one way in which candle flames may be rendered realistically, and that is by giving a full exposure to the subject without the candles being lighted. At the end of this exposure the lens is capped and the sacristan asked to light all the candles. This done, a further exposure of twelve or fifteen seconds is given, which will result in the images of the candle flames being rendered as they appear. Even under these conditions a well-backed plate or a film should be employed. Another point in work of this kind is that a panchromatic emulsion should be employed, since much of the composition consists of rich colouring, which, if improperly rendered, causes the picture to be disappointing.

* * *

The Small Camera on a Tripod. The small camera fitted with a large-aperture lens is so efficient as a hand camera that many workers do not seem to realise that there are times when short exposures upon a tripod may be given, effecting a very great saving in time in comparison with that needed for larger apparatus. When using the watch pocket instrument as a stand camera, there are one or two points that are often overlooked. As regards attaching the camera to a tripod (which may be of the telescopic variety) it is better to use a tripod board or adapter rather than screw the camera to the tripod, even if a bush is fitted, which is not always the case. For arranging the subject a wire-frame direct vision view-finder is of immense advantage, and should always be used in preference to attempting to compose the image upon a minute focussing screen. No worker who has tried both methods would willingly return to the latter, and it is a great pity that small cameras are not more frequently fitted with this most valuable accessory. Lastly, the exposures should be made with a flexible release, since as a rule it is not easy to expose for short periods without risk of shaking the camera, if the trigger release is used. In this case, an attempt should be made to steady the camera with the hand.

CLOUD NEGATIVES.

Formerly, it was easy to purchase cloud negatives in any size on either glass or film, the carbon film clouds of Mr. Green, of Berwick-on-Tweed, being very fine. These are no longer listed by the dealers, and it is to be presumed that, as articles of commerce, they have ceased to exist. This is, perhaps, not altogether to be regretted, as it was sometimes rather embarrassing for an exhibitor to find his cloud effect duplicated in one or more other pictures in the same show.

A considerable amount of judgment has to be exercised in the making of cloud negatives for printing-in, as distinguished from those in which the cloud effect is in itself the point of interest, as the latter class includes bold, stormy skies, sunsets and sunrises, while for the former the more common-place, but still beautiful, cumulus or cirrus forms are more generally suitable.

As the forms of these clouds vary during the course of the day it is desirable to mark upon each negative the hour at which it was taken. Although it does not matter in ordinary commercial work whether a mid-day sky is printed into an evening negative, so long as the general effect is good, critics may not be so merciful if the same thing is done in an avowedly pictorial composition. For important work it is even desirable to take the cloud and landscape from the same spot at the same time of day, but, of course, not necessarily on the same day, as the conditions are often not favourable for so doing.

Although clouds may sometimes be secured upon the same negative as the landscape subject, it is not well to rely on doing so very often, as it is next to impossible to obtain the necessary contrast in the sky if there is strong contrast in the foreground. Graduated colour screens have been tried to compensate for this disparity, but they are obviously of limited application, as the gradation must extend across the entire subject, irrespective of buildings or clumps of trees.

Fairly good cloud negatives may be obtained upon slow ordinary plates without a filter, but the occasions upon which this is possible are so few that it is well always to use colour-sensitive plates with a suitable filter. A deep yellow filter is usually not the most suitable. Even a deep blue sky does not give the impression of black to the eye, which is the result of the total elimination of blue resulting from too deep a filter. Exposure may present some difficulties at first, but a modification of the strip test, as used in bromide printing, will greatly help in this direction. As clouds are constantly moving, it is impossible to employ the ordinary method of drawing the shutter out in sections, but it is possible to arrange strips of card to partially mask the plate so that, say, three quite independent exposures can be made upon the same plate, giving double the time at each change. This test may be made at home, and, if possible, the time taken to secure a full tint upon a Watkins or Wynne meter should be noted, the meter being pointed to the

sky. Subsequently, the exposure may be increased or diminished in proportion to the meter time, stop, plate and filter being unaltered.

It might not be suspected that halation would cause trouble in this class of work, but it will be found that much better tone values will be obtained upon a backed plate or a film than upon an unbacked one. Films are particularly suitable for cloud work, as they can be printed from either side, so that the clouds may be lighted from the same direction as the landscape.

The camera should not be pointed up to the sky, but should be kept level and the front raised, so that the clouds appear as they would if taken with the landscape. Any keen observer of nature would detect the error of printing clouds situated near the zenith into a position near the horizon. In order to see readily which is the top of the negative a small portion of the view should be included upon the plate. Assistants have been known to print-in clouds standing upon their ends, though this is less likely to occur than printing them upside-down.

It has always been customary to make cloud negatives very thin, and there is no disadvantage in doing so for printing-out processes. With bromide printing and enlarging on the other hand it is better to aim at greater density, so that there is not such a great difference between the two exposures. If the view negative requires twenty seconds in the enlarger, and the cloud only two or three, a very slight error in exposure of the latter will spoil the print, while, if the sky required approximately the same exposure, the percentage of error would be much less.

As a general rule, it will be found easier and more expeditious to put in skies upon bromide prints by means of the enlarger, even if the prints are the same size as the negative. This course allows of the cloud being enlarged or reduced to any degree, or of being used on either side. Many failures result from excess of carefulness, that is to say, a mask which exactly follows the outline of the view is cut and held fairly close to the paper. This almost always results in a very perceptible band (either lighter or darker than the sky) showing at the junction, while trees often show white paper between the boughs. A roughly-cut mask kept well in motion, and allowing a slight overlap, will, as a rule, be found quite satisfactory.

THE BUSINESS SIDE OF PROFESSIONAL PHOTOGRAPHY.

(In the present chapter of the series by the professional photographer contributor who is using the pseudonym "Pelham Swinton," the writer describes a card index system for keeping under view the orders received from customers and their execution in the workshops and for providing the necessary records and reminders for collection of payments. The previous chapters have dealt with the general economic position of the photographer and the relation of a studio to its customers from several points of view. In the chapters still to appear "Pelham Swinton" will describe a system of ascertaining the cost of the goods supplied in a portraiture business and with the procedure of collecting accounts appropriate to a business such as that of a portrait photographer.)

III. THE PHOTOGRAPHER'S CLERICAL SYSTEM.

Of all the desirable factors in the composition of a "compleat" photographic business, the clerical department is the one most frequently neglected. The photographer who is occupied in operating, in the selection and display of specimens, and in the superintendence of his workrooms has little inclination to give attention to book-keeping. Besides this, it is an unsavoury subject. System of any kind is unpalatable to the artist; but a *clerical* system is nothing short of an abomination—an incubus—an iron shackle invented by accountants and fussy materialists wherewith to fetter æsthetic souls to the earth. In these unromantic days, however, it is perhaps wiser, however unpleasant it may be, to tolerate some species of a clerical system—even if it be merely to satisfy the impertinent questions of the income-tax inspector; and I propose to describe here a simple but very reliable system, sufficiently elastic to suit any size of photographic business, and one which, being self-checking, almost entirely eliminates the possibility of error, and reduces to the minimum the time spent in supervision.

At present the photographer is usually content to leave such things in the hands of his receptionist. If the receptionist happen to be a woman of business instincts then he is fortunate; but if she be merely a young lady whose gaze is entirely transfixed by the glitter of possible matrimony, and to whom book-keeping and correspondence seem even more unnecessary than to the photographer himself, then trouble may safely be predicted for that photographer. It were far better that a portrait lens were hanged about his neck, and that he were drowned in the depths of his developer, than that the inevitable wrath of his customers should descend upon him. Let it be clearly understood that I have no wish to discredit matrimony. I am told that it is a beautiful state, and I see no reason why receptionists, any more than photographers, should be debarred from entering therein. But when young persons of either sex accept responsible commercial posts, they should see that matrimony, like golf, is relegated to half holidays and spare moments.

The photographer's clerical system may be divided into three functions: (1) The recording of the sitting and the dispatch of the proofs; (2) the entry of the order, and the dispatch thereof; (3) the entry of the sum due, and the collection of the amount from the customer. In the case of a purely cash business this last function, of course, does not exist; but we shall presume that the business in question is a credit one.

Name BROWN, Mr. *Address:* 93, Ashley Street, Torrington-under-the-Marsh.

Sitting: June 26 '22. *Neg. No.* 41736 A, B & C.

Prints	*Colrd*	*Frames*	*Size and Style.*	*Instructions.*	*Dispd.*
12			Cabinet, Sepia.	Of 41736 B. Tone down right ear;	12 Cabts. Aug 9 '22
6	1		Do. Sketch.	Slightly tinted; exclude hands.	
			10×8 gilt.	Place coloured print in one of these, and send other empty	1 tinted & 2 frames, Aug. 11 '22

Date of Proofs } *From* July 4 '22. *Dispd.* July 3 '22.

Date of Order } *Rec.* July 17 '22. *From* Aug 12 '22

Charge to ROBT. D. BROWN, Esq., 596, Tuppeny Road, London, S.E.69.

Fig. 1

First of all, a card such as that illustrated in Fig. 1 is printed. It is advisable that this be of thin card or thick paper, measuring 8 in. by 5 in., and it is not necessary that

it be actually printed. A thousand or two can be run off very cheaply by any firm which undertakes the printing of letters, etc., by means of duplicating machines. Besides these cards, four standard 8 by 5 card index drawers are required.

When the customer has been photographed, her name, address, the date of the sitting, and the negative number are entered at the top of the card. At the same time, by means of a piece of carbon duplicating paper, a duplicate is made. These two cards are then clipped together with an ordinary wire fastener, and placed in drawer-file No. 1. At the front of this drawer are index cards labelled "C. de V.," "Cabinet," "8 in. by 6 in.," or any other shape or size of negative in common use by the firm. Behind one of these the two cards are placed, according to the size of portrait selected by the sitter. In due course the negatives are given to the receptionist to be named and numbered, and this information she obtains from the cards, which she replaces as before.

If the proofs have been promised by a certain date this fact will have been noted at the left-hand bottom corner of the cards, and the receptionist, now reminded of the fact, will send a note to the printer accordingly. The printer writes the number of the negative on the back of each proof, and when these come down to the reception room the cards are again referred to for the name and address, and the date of the dispatch of the proofs is entered below the "date promised." The cards are now replaced in the drawer, but behind their original position, where there is a double set of alphabet index cards. The cards are placed in the first alphabet, behind the initial letter proper to them, and here they lie until the customer gives her order.

On receipt of the order the details thereof are added to both cards—the size and style, instructions, etc., being entered each under its proper heading, and the number of prints, coloured prints, or frames, written in their respective columns—thus enabling one to see at a glance the kind of items composing the order, and to prevent an order for two frames being mistaken for an order for two prints, or a coloured print for a frame. Besides this, the date on which the order is received is entered at the left bottom corner, and also the date for which it is promised; while the name and address of the person to whom the whole is chargeable is written in the space provided—if the person to be charged is not the person photographed. Otherwise, this space is left blank.

The two cards are now separated, the rough proofs being clipped to the duplicate card and sent to the printer, and the other being replaced in the drawer, but still farther back, in a second alphabet, of which there is a double set also.

Thus we have in this first drawer: (1) A set of three or four index cards representing the different sizes of portraits. Here the cards lie until the dispatch of the proofs, the completion of the first clerical function. (2) Two double sets of alphabet index cards. Here the cards lie, in the first set, until the arrival of the order, and in the second set until the order is dispatched. This completes the second clerical function.

The reason for the use of a *double* set of alphabet index cards, in each of these two cases is as follows:—During the month, say, of January, all cards are placed in the *first* alphabet of each set. On February 1 the second alphabet in each set is placed in front of the first, and all cards during February are placed in this. On March 1 the first alphabets fall to be used once again, but it will be found that a few cards placed in these during January still linger behind. These cards represent, in the one case, sittings for which no order has been given, and, in the other case, orders on hand which have been unduly delayed. These cards must now be extracted, and, in the case of unordered proofs, a carefully-worded letter is sent to the customer asking if the proofs submitted on such-and-such a date have met with approval, and how many finished copies will be required. She will then either give an order or arrange a second sitting. In the case of orders on hand which have been delayed, it is necessary merely for the photographer to pay a visit to his workrooms, the cards in his hand, and discover the cause of the delay. All such overdue cards should be kept either by the receptionist or by the photographer in a prominent place where he or she will see them every morning, and where they will lie until the matter is rectified.

Thus it will be seen that, provided the alphabets are changed over regularly on the first day of each month, or at any other convenient period, it is impossible that any proofs can remain unordered or that any order be overlooked or forgotten.

Now let us follow the course of the duplicate card to which the rough proofs have been clipped. This goes to the printer—if the negatives have been retouched before proofing—and the printer gleans from the card all the instructions which are applicable to him. When he has completed the order the card is passed on, along with the prints, to the mounter, and thence to the finishers. It is thus unnecessary for the photographer or the receptionist to waste time trotting from room to room giving verbal instructions. Everything is here in writing for each department to see. Meanwhile, in the reception room, the other card remains in the file; and, should the customer call while the order is in progress to ask some question, or to make some alteration, it is necessary only for the receptionist to refer to the card, and in a moment she is conversant with all the details of the order and is able to talk intelligently regarding it. This is an obvious advantage. Were the details of the order buried in a book several minutes might be spent before they could be traced, and customers are apt to forget that one has other customers and that the human memory is imperfect.

When the order is completed the duplicate card accompanies it down to the reception room. The receptionist extracts the corresponding card from the file, checks and dispatches the order, and enters the date in the column headed "Dispd." The duplicate card is now destroyed. Now the back of the original card is printed with the usual ledger ruling, as in fig. 2. Here the name and address of

Name: BROWN, ROBT. D. *Address:* 596, Tuppeny Road, London, S.E.69.
Rend. 1922.

			£ s. d.	£ s. d.
Oct. 22	Aug. 11	To 12 Cabinet sepia of Mrs. Brown	3 3 0	
Nov. 22		1 Sketch, tinted	0 15 6	
Dec. 22		2 Gilt frames, 10×8 ..	0 13 0	
			£4 11 6	
	Dec. 10	By Cheque		£4 11 6

Fig. 2.

the person chargeable are written, and the items and amounts entered below. At the same time these details are entered in the firm's day book, which must contain a continuous record of the daily turnover. This simple operation over, the card is dropped into drawer-file No. 2. This is the ledger file, and contains all the outstanding accounts. It is of unusual composition, and may at first seem somewhat elaborate. It is composed of no less than twelve sets of alphabets, one for each month of the year, and with the name of the month on a card in front of each set. The current month is kept always at the front of the drawer, and the remainder in their sequence behind it. If the current month be March, then the remaining eleven months will stand behind in order—February, January, December, November, etc., with April the farthest back. All cards during March are dropped into the March alphabet; then on the first day of April the April alphabet is brought from its place at the

back and placed in front of March. At the same time, as in the case of the other file, any cards which still remain from the previous April are extracted. Such accounts are now a year old; and if they have not already received very special attention it is time that they did.

Thus we see once more that no card can be overlooked, and all accounts belonging to each particular stage are automatically grouped together. The alphabets toward the front of the drawer will always be fairly full, and a gradual thinning will be noticeable in those receding toward the back. By a monthly supervision of these alphabets it is possible practically to eliminate the risk of bad debts.

In the case of re-orders the same system is employed, with the exception that the card goes directly into the "order-on-hand" alphabet in file No. 1 and the duplicate card goes straight to the printer. Also, of course, the spaces for entering details of the sitting and proofs are unused.

Sometimes it happens that the entire order is not sent down from the workrooms at once, and that, say, twelve ordinary prints are finished before a coloured print or an enlargement. In this case the duplicate card is sent down along with the first portion of the order, so that the receptionist may know whose order it is, and be able to dispatch that portion, if desired. In such a case the items dispatched, as well as the date, are entered in the "dispatched" column; and the account is not charged up until the whole order has been dispatched.

When the account for the order has been paid the card is placed in one or other of the two remaining files. No "paid" card must be left to clog the ledger file. These two files contain one alphabet each, but more subdivided than the simple A-B-C type. Alphabets can be obtained with various subdivisions, such as Ab-Ac-Ad-Ae-, Ba-Be, etc., which render a card much more readily found. An alphabet with forty divisions is most suitable in this case. If the "paid" card represents a re-order it is placed in No. 3 file, where it lies for reference purposes; but if it is a card of a sitting and first order, it is placed in No. 4, and thus we have a negative register without further trouble. And not only does this constitute a negative register, but each card contains every detail of the customer's first order, all instructions applicable to future prints from her negatives, how much she paid, and how long she took to pay for it.

At the end of each year the contents of these two files are transferred, *en bloc*, to cheap cardboard receptacles of similar dimensions, and having the year written on each. Of course, many accounts belonging to the old year will remain unpaid during the first few months of the new year; and such cards, when paid, must be placed in the file proper to their year, and not in the current file.

With the above system it is possible to run any photographic business smoothly and satisfactorily. And the elasticity of the system is unlimited. In the day of success all that the photographer need do is to increase the number of his files. And, when tempted to cavil at the daily discipline demanded by clerical work, he should remember with meekness and gratitude that, compared with systems required in other kinds of business, it is mercifully simple.

PELHAM SWINTON.

ACID AMIDOL FOR THE BUSY PRINTER.

THE respective merits of amidol and M.Q. have often been discussed in these columns, but there is no getting away from the fact that amidol is extremely popular with the trade printer. The fact of it being a neutral solution (or practically so) makes it suitable for the water of some districts in preventing the formation of insoluble compounds, which give the prints a gritty surface. It is very simple to make up, and has considerable covering power.

The chief disadvantage of amidol is that it does not keep in solution. Three days is considered to be its effective life, but I have found that with both neutral and acid amidol the covering power is very feeble after two days. However, this is not such a formidable disadvantage when one can keep a stock solution of sodium sulphite and add dry amidol as required just before using. After the continuous use for some months of an acid amidol developer for many thousands of prints and enlargements on bromide and contact prints on gaslight papers, I find it excellent, clean-working, constant, and what might be called a "business proposition." I do not notice any improvement in the keeping properties of acid amidol, but it is quite regular in use, due, I think, to the acid sulphite solution being constant and not so liable to deteriorate as a plain solution. The image builds up in the usual way, and development of bromides is complete in two minutes with ½ grain of potass bromide to the ounce of developer. Some makes reach finality in 1½ minutes. Gaslight prints develop in one minute, or sometimes less with the vigorous papers. Well diluted, it gives excellent colours on the slow development papers.

The formula given below is suitable for practically all the development papers. The acid sulphite solution is made up in a four-gallon jar with a wooden tap fitted for drawing off the required amount. This jar is placed on a strong shelf at a convenient height and a small hanging jar is kept under the tap in case of slight leakage.

Stock Acid Sulphite Solution.

A	Sodium sulphite (cryst.)...	8 lbs.
	Water (hot) about ...	3 gallons (480 ozs.)
B	Potass metabisulphite ...	2½ ozs.
	Hot water	½ gallon (80 ozs.)

When cool mix by slowly adding the metabisulphite (A) solution to the sulphite (B) solution, and make up to 4 gallons with water. To make a working bath, use the following proportions.

Working Bath.

Acid sulphite solution	40 ozs.
Water	40 ozs.
Amidol (dry)	200 grs.
Potass bromide	(See below)

The potass bromide plays such an important part in affecting the colour of the image, time of development, and prevention of fog that special care must be taken to ensure accuracy. This salt should be made up in a 10 per cent. solution, and always accurately measured out, bearing in mind that the average amount required for bromides is ½ to ¾ grain to the ounce of developer. In a 10 per cent. solution every dram contains six grains, every 10 minims contains one grain, and every min m (or drop) contains 1/10 grain.

Bromides and gaslights develop to a nice black colour with ½ grain of potass bromide to the ounce of developer, and to obtain a warm or olive black on gaslight, chloro-bromide, or studio development papers, it is necessary to add more (up to 6 grains to the oz.) And also to dilute the developer. It is interesting to note that in diluting the developer for gaslight papers the contrast with the vigorous grade is increased, but

quite the reverse happens when using a diluted developer for bromides. Potass. bromide has little or no influence upon the contrast given by any particular paper, but it is in practice absolutely necessary to prevent fog and to control the colour of the image. Absence of bromide will give quite a blue colour on gaslight, but the whites will often be degraded.

The following table may be useful for reference when a particular colour is desired:—

Process.	*Grade.*	*Exposure.*	*Potass. Brom., grains per oz.*	*Colour.*
Gaslight.	Vigorous, normal.	Correct.	¼ gr.	Pure black.
,,	Soft.	Double normal.	1 ,,	Olive black.
,,	...	4 times normal.	4 ,,	Brown black.
Bromide.	All.	Correct.	¼ ,,	Pure black.
,,	,,	Normal. plus ⅓	1 ,,	Greenish black.

The latter colour is produced on bromides that are to be toned in the hypo-alum bath. The development is stopped short of finality, so as to ensure a warm sepia tone in this toning bath. Bromides developed to finality give a rather cold tone in hypo-alum.

Fixing Bath.

Hypo	18 lbs.
Hot water	34 quarts.

When cool add the following solution:—

Potass metabisulphite	5 ozs.
Hot water...	2 quarts.

It is convenient to make up a large fixing-bath for a busy man. The formula is as given above. I am lucky enough to have a large white earthenware sink holding 40 quarts easily, and this is fitted with a pull-out plug. There is also a steam pipe fitted under the sink for use in winter or on cold days.

B. R. Rawkins.

PARIS NOTES.

An Unpublished Niépce Letter.

We owe to M. G. Cromer, well known for his writings on photography and an enthusiastic collector of documents relating to the history of photography, the rediscovery of an unpublished letter of J. Nicéphore Niépce. This letter, bearing the date of May 26, 1826, and addressed to Niépce's son Isidore, has hitherto been known only by a few lines quoted in Fouque's work of 1867, "La Verité sur l'Invention de la Photographie." It alludes to the images which for some time prior to the writing of the letter had been obtained by Niépce in the camera on pewter plates sensitised with Syrian asphalt. It was these results to which Niépce applied the description "points de vue d'après nature." A collotype facsimile of the letter has been published in the March issue of the Bulletin of the French Photographic Society.

A new example of the Russell Effect.

The late Professor W. J. Russell, as is well known, made numerous observations some years ago on the effect of exposing a photographic plate in the dark in contact with pieces of wood, etc. By allowing, for example, a piece of wood to remain for a sufficient time in contact with the emulsion, an image was produced on the plate showing by the different densities the fibres of the material characteristic of spring and autumn growth. A Parisian engineer, M. Bardier, has obtained the same results with a sample of lignite which had become almost converted into jet, and thus was many thousands of years old. The specimen was obtained in the course of a visit to Madagascar. Two faces of the specimen were polished in a dark-room, one parallel to the fibres of the fossilised wood, the other perpendicularly to these fibres. Both surfaces, after contact "exposure" for several hours, showed a quiet sharp image (more pronounced than in the sample itself) of the yearly rings in the wood and of the fibrous structure. The image was slightly more intense in the case of a second series of exposures made after exposure of the lignite to light.

M. G. Reboul, Professor of Physics in the University of Poitiers, has recently found that by wrapping a photographic plate in black paper and by bringing two spring electric contacts on to the paper in such a manner as to produce a difference of potential of about 1,000 volts (the effect begins at about 200 volts) there is obtained after development an intense image showing the structure of the paper with considerable fidelity. The action is more pronounced towards the positive pole. Check experiments were made, so as to eliminate pressure of the terminals as a possible cause of the phenomenon, and it would seem that successive falls in potential to points where there is discontinuity of resistance produce minute discharges, accompanied by radiation which is invisible yet exerts an action on the photographic emulsion.

Orthochromatic Sensitizing.

About the year 1912 a French expert in orthochromatism, M. F. Monpillard, succeeded in increasing the sensitiveness of Autochrome plates to a considerable degree, about 30 times. In collaboration with M. L. Gimpel, a worker of great experience in the use of the Autochrome plate in Press photography, he obtained in good light exposures of the order of 1-100th of a second, and even was able to make slow shutter exposures of scenes on the stage under the ordinary theatre lighting. A number of these results were shown at the time at a meeting of the French Photographic Society, and were greatly admired. The process was also applicable to ordinary plates, conferring upon them both a greater degree of colour sensitiveness in addition to general speed, and rendering them exceedingly effective for photography by artificial light. The extra-sensitised plates had, however, one great defect; they would keep for only a few hours, for not more than a day at the longest. M. Monpillard, however, hoped to overcome this difficulty. The method used for the extra-sensitising was not published at the time, but a sealed packet descriptive of the principle was deposited with the French Photographic Society. Recent circumstances having prevented M. Monpillard from continuing his work, the contents of the packet have been published at his request, and it has been disclosed that the secret of this extra-sensitising consists in the addition to the mixture of the usual isocyanine and carbocyanine dyes (pinaverdol, pinacyanol, etc.) of a small quantity of silver chloride previously dissolved in dilute ammonia. It is essential that as soon as the sensitising bath has been used any adhering liquid shall be rapidly removed with a whirler and the plates dried by a rapid current of air.

Process Emulsions.

The manufacture of emulsions of fine grain and great contrast, as required in photo-mechanical work, has long been neglected in France, but two emulsions for this purpose have recently been introduced. One of these is the "Collodium" of Guilleminot, Boespflug et Cie., its name being chosen as an indication that the plate serves as a substitute of wet collodion. The other is a slow stripping paper, issued as "Rex," by MM. Michel, Paillot et Cie.

X-Ray Work.

A Parisian medical practitioner of radiography, Dr. A. Zimmern, has recently observed that, without the aid of an intensifying screen, exposures may be made on X-ray plates with a reduction of about 35 per cent. in the time by previously heating the plate to 110 deg. F. Other conditions remaining the same, the same density is obtained on the warmed plate in this lesser time as that produced when working at 60 deg. F. Unfortunately, the installations commonly used for X-ray exposures are not well adapted for making use of this observation.

Apropos of X-rays, it may be mentioned that a recent paper by M. F. Holweck, a student and collaborator of Madame Curie, has gone a long way to step the gap which hitherto has existed between ultra-violet and X-rays in the great series of waves propagated with the same speed as light. This experimenter has been able to produce X-rays of relatively enormous wave length (extra soft rays), forming a continuous series with the ultra-violet rays of very short wave length obtained in the United States by Millikan.

Stereo-photo-topography.

An interesting demonstration has been arranged for the scientific section of the French Photographic Society by M. J. Prédhumeau of his stereo-topometer, the construction of which I mentioned a few months ago ("B.J.," January 13, 1922, p. 15). The two negatives are taken from two stations, the separation of which is preferably 500 times the average separation of the eyes. The exposures are made on the two halves of a slow fine grain plate in a stereoscopic camera provided with two lenses, which are alternately uncapped. The centre line at each exposure is parallel to the straight line joining the two stations, and the optical axes are horizontal and perpendicular to the line of the stations, the various adjustments being made by means of a theodolite serving as a support for the camera and by aid of a sight which for each exposure is placed at the station not occupied by the camera, that is to say the theodolite and sight, each on a tripod, exchange places between the two stations.

In using the negative thus obtained it is replaced in the same camera as that in which it was exposed so as to take up precisely the same position as that when the exposures were made. The camera is then placed in the stereo-topometer with the same inclination of the centre line as that which was given to it when making the exposures, this line being thus obtained parallel with the base. To each objective is attached a converging lens of 32 in. focal length, and the negative is observed from behind by means of a stereoscope having a magnification of about ten times, and fitted with prisms for reversal of the images. As a means of receiving in the stereoscope the light which comes from the objective, there is placed behind each of the elements of the stereogram a lens of plano-convex field having its focus at the exit node of the corresponding objective. The combining apparatus includes, in front of the photographic camera, a large frame turning on a vertical axis. A movable carriage on this frame carries with it a vertical rod, along which can be raised or lowered a "voyant" (a positive transparency of a flag or other design), lighted from behind. The various movements of the "voyant" are controlled partly with the hands and partly with the feet of the observer using the stereoscope. At the instant when the flag (an image of which is projected on to the negative by each objective) is seen to come, in the stereoscope, exactly on a point of the subject, the "voyant" then occupies in space the position where the subject appears to be reconstituted stereoscopically. Then by means of a pantograph connected to the "voyant" the lines of the subject or the horizontal sections of the ground showing the configuration of the latter can be traced on the plate. The great advantage of this apparatus is that all the registrations are done in the photographic camera used for taking the negative and not in the stereoscope, as is the case with the von Orel stereo-autograph. The whole construction calls for few exact adjustments; only the pantograph and its connection to the "voyant" require to be made with great accuracy.

Cinematography.

A very ingenious system in cinematograph projection has just been worked out by M. Lenouvel, Professor of Physics in the Rouen High School. In seeking to simplify, for the purposes of his class instruction, the alternating projection of animated photographs and ordinary lantern slides, M. Lenouvel has at the same time obtained an improvement of more than 300 per cent. in the light-efficiency of the projector. The light-box, carrying the 4½-in. condenser and the lantern slide carrier, are separated by the cinematograph mechanism. Between the two pieces of apparatus is an objective formed of two achromatic lenses, the adjustment being such that the image of the condenser or of a plane a little in front of the condenser (that is to say the surface of a slide placed in the carrier) is formed exactly in the gate. In contact with the latter, in front of or behind the position of the film, a plano-convex lens is arranged, transmitting to the projection lens the rays which, without this addition, would diverge after passing through the gate. Under these conditions the whole of the light which passes the condenser is used for the projection of the picture. No adjustment is necessary when changing from cinematograph to ordinary projection. Lastly, when the apparatus is used for the projection of apparatus such as electroscopes, living specimens in tanks, etc., the image is projected on to the screen the right way up instead of being inverted as usual. It should be added that the whole apparatus resembles an astronomical telescope provided with a Dollond rectifier, the source of light occupying the same position relatively to the projection apparatus as the eye to this telescope.

A notable step forward has been made in the taking of high-speed cinematograph films by the G.V. camera made by the firm of A. Debrie, of Paris, from the designs of M. G. E. Labrely. Provided there has been great exactness in the perforation of the film (in which respect no latitude is permissible), this camera allows of taking up to 100 pictures per second when the handle is turned by hand at the normal speed, or up to 240 pictures per second with electric drive from a small battery. The camera can also be worked at normal speed, thus avoiding the cost and bulk of two separate outfits. The two film spools are contained in the same box, accommodating 400 ft. of film, a fresh box being fitted in five seconds. Inclusive of case, the weight of the camera is 29 lbs. The apparatus, which permits of prolonging the time of movement ten to fifteen times, has already rendered valuable scientific and industrial services in the analysis of rapid movements. Many of the cameras already constructed have been supplied to the United States.

M. L. Clement, a leading technical authority in the cellulose ether industry, has recently drawn up the report asked of him by the cinematograph section of the French Photographic Society on a ready method of comparing the qualities of films on different supports, that is to say a method which does not involve the chemical and mechanical tests employed by film makers, but is applicable by users and renters of film. The test for resistance which is proposed consists in making an endless loop of film about 2 yds. in length, consisting of equal lengths of the two films to be compared. These are cemented by their ends as perfectly as possible. The films, which should have been perforated of the same pitch on the same machine, and should also have undergone the same treatment as regards printing, development and drying. The loop is placed in an ordinary cinematograph projector, and is there arranged so as to receive a tension, by means of a roller mounted on a weighted lever, when the machine is put into normal operation. The motor of the projector is then put in action and an account kept of the number of times the band of film passes

round. This is done by making a mark on the band. Every five minutes the machine is stopped and the perforation examined, and the test is completed when all the perforations of one of the two pieces of film are distinctly affected. Examination of the different fractures is then made, with the exception of those close to the junctions in the film. The number of times which the film has to be passed round in order to produce this result varies from 200 to 300 according to the quality of the projector, and thus two bands of film on the same support may be compared or, alternatively, two projectors may be compared by using identical film bands in each. The various causes which contribute to changes in the film with time can be greatly accelerated by placing the film in a heated atmosphere, temperature playing very much the same part as time. A similar test may then be carried out on a band of two films which has been exposed for about 120 hours in an oven at a temperature of 140 deg. F. The degree to which a film resists this application of heat serves as a useful indication of its keeping qualities.

L. P. Clerc.

SPENT DEVELOPERS IN THE DESENSITISING OF PHOTOGRAPHIC PLATES.

In an article entitled "Desensitising Silver Bromide and Safranine Treatment." Dr. Lüppo-Cramer has recently stated (Zeitschrift f. angewandte Chemie, 1922, 35, 69) that the oxidation products of certain developers, such as amidol and its homologues, greatly diminish the sensitivity of silver bromide to light. Thus, development can be undertaken in bright yellow light, provided that the plate has been previously immersed in a bath of exhausted amidol developer.

It is also stated that ortho-chromatic and, with certain precautions, pan-chromatic plates can be developed in the same way.

Dr. Lüppo-Cramer gives but few details of the methods he employed. Apparently spent amidol of the usual strength was used, since it is stated that the desensitising bath contained 0.05 per cent. of oxidised amidol. Development was then conducted in bright yellow light of 5-candle power intensity, with a screen of Tartrazine or filter yellow.

The present writer has tested this process and experiments have been carried out to obtain suitable working details. The method certainly has considerable possibilities and quite good results have now been obtained.

For these experiments it was considered very essential to employ an amidol developer that was fully oxidised (exhausted) In order to make certain that the solution no longer possessed developing powers, a series of experiments were carried out to ascertain the exact amount of amidol required to convert a fixed quantity of exposed silver bromide into metallic silver. From quantitative experiments, it is now established that one gram molecule of silver bromide (188 grs.) is reduced to 108 grams of silver by one gram molecule of amidol (181 grs.).

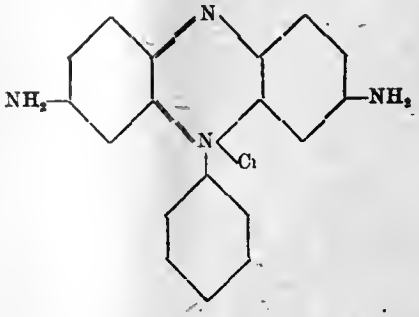
The oxidised amidol solution was therefore prepared by warming 500ccs. of ordinary amidol developer with six grams of freshly precipitated silver bromide, which had been previously washed free from other salts and then completely exposed to diffused daylight. The undecomposed excess of silver bromide and the metal formed were filtered off, and the filtrate was ready for use as a desensitiser.

In investigating the utility of Dr. Lüppo-Cramer's process, the exposed plates were immersed for ten minutes in the slightly warmed (21 deg. C. or 70 deg. F.) oxidised (spent) developer. They were then developed in the usual way. As soon as the plates were covered with the developing solution a bright yellow light was substituted for the red one employed up to this stage. The progress of development was observed, and the plates could be occasionally removed from the solution and held up to the light without the risk of "fogging." On one occasion diffused daylight was admitted into the dark-room during development, and no perceptible "fog" was detected afterwards.

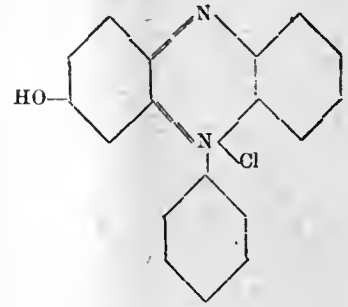
It was, of course, found that unoxidised amidol is not a desensitiser. Plates that were being developed in the usual manner "fogged" immediately on exposure to bright yellow light.

When this process is compared with the desensitising of silver bromide with safranin it is noticeable that the oxidised amidol solution is used in much greater strength, since safranin can be employed in as weak a solution as one part in two thousand of water. This solution is quite light red. The oxidised amidol solution is deep reddish brown.

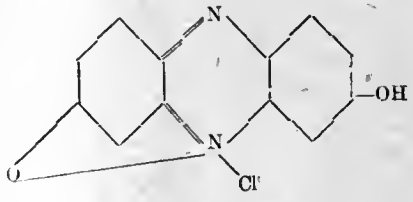
Presumably these substances function in a similar manner, although the presence of the accumulated potassium bromide, etc., in the spent developer must not be overlooked, since this restrainer may have some influence. Dr. Lüppo-Cramer is of opinion (*loc. cit.*) that it is the amino-group which plays an important part in desensitising the silver bromide. The formula for pheno-safranine is:—



If the amino-groups are replaced with oxygen or hydroxyl the safraninone (1) or safranol (2) so produced are found to possess no desensitising power.

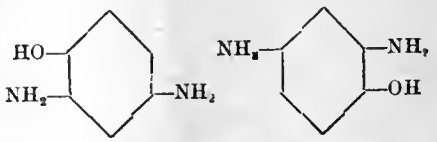


1.



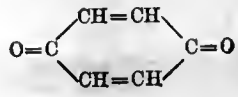
2.

The oxidation product or products of amidol have not yet been identified, but it is probable that an imino-quinone substance is formed. If the formulæ of two molecules of amidol base are written thus:—



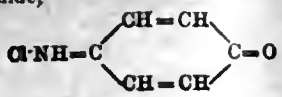
it will be seen that oxidation and condensation might give rise to a complex compound having a similar structure to that of safranin.

p-Phenylene diamine and *p*-amino-phenol (rodinal) may be regarded as homologues of amidol. When these substances are vigorously oxidised in acid solution they both yield quinone,



a deeply-coloured body which has now been found to possess no desensitising properties. Quinone is also the oxidation product of hydroquinone.

When p-aminophenol was carefully oxidised it first yielded quinone chloro-imide,



This substance readily oxidised further to quinone, but when acted upon by stannous chloride solution it was reconverted into p-amino-phenol.

The oxidation product of rodinal developer probably does not contain an amino-group. This conclusion has received strong support from the chemical evidence which has failed to indicate the presence of this radicle in spent rodinal developer. Thus the quinone chloro-imide would appear to be the active substance when oxidised rodinal developer acts as a desensitiser. This is not in agreement with Dr. Lüppo-Cramer's amino-group theory mentioned above. Further, the usual chemical tests have also failed to reveal the presence of an amino-group in completely oxidised amidol developer.

This negative evidence must not be considered sufficiently adequate to disprove Dr. Lüppo-Cramer's theory. The matter will be definitely decided when the exact constitution of the oxidised amidol has been determined.

J. G. F. Druce, M.Sc., A.I.C.

ELECTRIC CURRENT AT POWER RATE.

In the King's Bench Division on May 9 and 10, before Mr. Justice Swift, an action was brought by the Westminster Electric Supply Corporation, Ltd., of Eccleston Place, Westminster, S.W., against the Wykeham Studios, Ltd., 165, Victoria Street, Westminster, to recover a balance of account for electricity supplied to defendants. The case raised an interesting question as to whether current used for arc lamps in photographic businesses should be charged at lighting rate or power rate. Mr. W. S. Kennedy appeared for the plaintiffs (instructed by Fowler & Co.), and Mr. G. R. Blanco White represented defendants (instructed by Lickfold & Sons).

Mr. Kennedy, in opening the case, referred to the amount claimed, £82 18s. 5d., for the three periods, Midsummer, Michaelmas and Christmas, 1921, but defendants had admitted £48 5s. 10d., and paid this, so that only the small balance was in dispute. There was no dispute about the quantity of current, the sole question was as to the rate which plaintiffs were entitled to charge for current used by the arc lamp employed in the taking of photographs. The defendants' claim was that the charge should be the power rate. The plaintiffs' case was that they were fully entitled to charge rates up to the maximum on the schedule so long as no undue preference was shown.

The plaintiffs were authorised to carry on business under the Electric Lighting Orders Confirmation (No. 2) Act, 1889, which is in confirmation of a Provisional order made under the Electric Lighting Acts, 1882 and 1888. The Company was also governed by the London (Westminster and Kensington) Electric Supply Company's Act, 1908.

On July 26, 1913, the defendants entered into a contract to take a supply for certain lamps for lighting purposes and for a photographic arc lamp at 165, Victoria Street, which agreement provided for a lighting rate of 4½d. per Board of Trade unit, and for units used for photographic arc lamps at 1d. per unit, both the rates then current for light and power respectively. This arc lamp was on a separate circuit. In June, 1916, plaintiffs gave notice of alteration of terms of supply and submitted a new contract, which was signed by the defendants on September 28, 1916. This provided for a certain number of incandescent lamps for lighting as before, and one 50-ampere photographic arc lamp. The power rate was at the net rate of 1d per unit, but the lighting rate was raised. After 1916 there were continuous increases in costs of production, and early in 1921 plaintiffs gave three months' notice, expiring May 15 of that year, to terminate the agreement, and submitted a new contract for defendants to sign. This new contract provided for the studio arc being charged at the full lighting rate, which was then 8d. per unit as against the then power rate of 2d. This defendants did not sign, contending that they were entitled to have that portion of their current used solely for photographic purposes, and supplied through a separate meter, at power rates.

Mr. Kennedy said his submission broadly was that so long as the maximum in the schedule was not exceeded and the provisions of Section 19 and 20 of the Act of 1882 as to undue preference were not contravened, the charge was, so to speak, "at large." The limit was 8d. according to the schedule. There was no distinction in the Act as between electricity for lighting and for power, and by the agreement of 1916 the plaintiffs were entitled to vary the rates on giving not less than seven days' notice. Counsel mentioned that the matter of these charges had been discussed with the Professional Photographers' Association, and it had been agreed that the charge should be 4d. per unit, so it would appear that it could not be suggested that the plaintiffs were trying in any way to exact an exorbitant charge. In fact, 4d. was the charge plaintiffs were really seeking to make the defendants liable for. Counsel added that he did not suggest that this arc lamp was used for ordinary illuminating purposes. He submitted that if the company decided to charge 8d. for every unit supplied throughout the area no customer would have any remedy except on application to the Ministry of Transport.

Mr. Kennedy continued his arguments on behalf of the plaintiff company, quoting the decision in the case of the Attorney-General in Victoria v. Melbourne Corporation appeal case, 1907.

His Lordship: "You have one system of charging for lighting and another for power have you not?"

Mr. Kennedy said "No," the charge was a price per unit in each case.

His Lordship: "You say a division into lighting and power is not a differentiation?"

Mr. Kennedy said that was his contention, there could be no preference given, but it was only in the case of persons using the supply under similar conditions. There was no suggestion in the case that it was necessary to supply power at one rate and lighting at another. He said it was legitimate for the plaintiffs to charge different rates for power purposes. No suggestion was made in the defence that any undue preference had been given. The conditions that would follow from a decision that the power rate was to be the same in the case of every consumer would be very serious. He did not suggest that "the dreadful consequence" was one that would appeal to his Lordship, or that it would affect his construction of the Act of Parliament merely because serious consequences would arise, but such a construction of the Act as his friend was contending for would lead to a state of affairs never contemplated by the Legislature or anyone connected with the Act. If it was held that every consumer of power was to be supplied at the same rate which could not be altered, then the supply for power would cease, because it was impossible for any undertaking to supply a person using but a small amount for a short time at the same price that they would supply power to a railway company. As his Lordship was aware the question of the supply of power for the electrification of some of the railways round London was under consideration by the Ministry of Transport, and no railway with its large and continuous load would take power on these terms. Such a company would not pay a price like 4d. per unit, but would want it at 1½d or ¾d. It was impossible to supply a small man with one light and one motor at such a price as that.

Referring to the defendants' affidavit he said they claimed to continue the use of their arc lamp at power rates because they had hitherto been supplied at that rate. He did not admit it was power because it was charged for at power rates. No company had a power rate which they had not power to vary under the circumstances in which it was used. He did not know that he could complain of defendants' statement that the defendants had been using the light by a separate meter and at a lower rate. Naturally the company gave him a separate meter in the circumstances.

His Lordship: "Does it concern you to say that this is separate from the power rate supposing you have the right to fix your power rate according to circumstances?"

Mr. Kennedy did not think it did. If plaintiffs were entitled to vary the power rate then he was not concerned to deny that defendants were supplied for power.

His Lordship said on the facts he was inclined to think that this was current supplied for power purposes, and the plaintiffs' case was that it was a supply in which they had a right to differentiate as to the rate at which they charged. The defendants appeared to have assumed that there was no right to differentiate in the charges for power.

Mr. Blanco White said he did not wish to put his case higher than it was. The point was they might charge him the power rate

if they did not charge more than the maximum. That was what they were doing, he contended.

His Lordship: "Have they charged you more than the maximum rate!"

Mr. Blanco White said they had in his opinion.

His Lordship: "You are complaining of undue preference because they are charging you more than other users for power purposes, although somewhat less than the lighting rate?"

Mr. Blanco White said he contended that they were in the power class, and were entitled in these circumstances to be charged not more than the least favoured of the power users. What the company had done was to slightly alter their form of agreement for the supply of electric energy. They originally took the supply in 1916, which was terminated in 1921. Then plaintiffs charged at full lighting rate of 8d. to Michaelmas, 1921, when they entered into an agreement with the Association (who admitted it was not a power charge) to charge 4d. per unit. His clients were not parties to that agreement, and they said the charge for power was 2d. or 1½d. per unit, and as they were in the power class, they said they were being charged more than the maximum for power, in that they were asked to pay 4d. instead of 1½d. The power charge was originally 1d., but had gone up during the war.

His Lordship: "They were making a new class altogether?"

Mr. Blanco White said they had. The Photographers' Association admitted it was not power, and, in consideration of the admission, got a reduction, but the defendant was not bound by that, and, in consequence, the matter was now before his Lordship for determination.

His Lordship pointed out that the members of the Photographers' Association were paying a different figure than either light or power consumers.

Mr. Blanco White said that was so, and it was where the company got into the difficulty; they had made a special rate for photography.

His Lordship: "They have treated them not as a different class, but have created a new rate. There are now illuminating, power, and photographic rates."

In reply to his Lordship, Mr. Blanco White suggested that just because photographers used a photographic arc lamp, they wanted to get them into a class by themselves. He could show that in Westminster engineers' printers using the arc light for the purposes of producing their engineering blue prints were charged power rate.

Mr. Kennedy said there was no comparison between the two cases. The engineers used the light for hours at a time, while the ordinary photographer only used it from time to time at short intervals when taking a photograph.

Mr. Blanco White said he relied upon the plaintiffs' general advertisement that they supplied electricity for power purposes at 1½d. per unit. They had elected to supply power at 1½d. per unit and he was entitled to be supplied at that figure.

Mr. Kennedy admitted that the company offered to supply electricity for the purposes of power at 1½d. per unit, but it was a price adopted in some cases, but not in every case. In each case a special agreement was made. They were charging the defendants the same rate as every other consumer in the district who was using the current for the same purpose and under similar circumstances. The defendants had had an agreement previously subject to three months' notice to terminate, and also a seven days' notice, in accordance with the Act, to alter the rates, and these notices had been duly given by the company when they proposed to alter the rates. Unless the defendants went to the length of saying that a fixed sum must be paid by all power users the defendants must fail. There was no evidence of undue preference, neither did Mr. Blanco White suggest that his client was charged above the maximum, which was 8d. In these circumstances, he said, the company were justified in charging defendant 4d. per unit.

Mr. Blanco White having stated that he had experts present relative to evidence on wave lengths and blue-print photographers, radiator users on the plaintiffs' circuits, if his Lordship should consider it necessary for him to proceed further,

His Lordship said the case raised what might be important points in connection with the supply of electricity, and he would reserve his judgment. It had been ably argued on both sides by counsel, from whom he had received great assistance.

The services of Mr. J. C. Elvey, A.M.I.E.E., etc., consulting electrical engineer, were retained by defendants in the preparation of the case.

GERMAN SCIENTIFIC GOODS.

Board of Trade Inquiry Committee.

The first meeting of the Committee of Inquiry set up by the Board of Trade to take evidence and report on the sale of optical and other scientific instruments manufactured in Germany took place at the Hotel Windsor (Mines Department) on May 15. The Committee, as already announced in these columns, consists of Sir R. Henry Rew, K.C.B. (chairman), Mr. A. K. Davies, Mr. Rayner Goddard, Mr. A. E. Holmes, and Mr. J. F. Mason, J.P., with Mr. T. Turner, secretary. The Committee is instructed to report to the President of the Board of Trade:—

(1) Whether the conditions specified in Section 2, Sub-section (1), of the Safeguarding of Industries Act, 1921, are fulfilled in respect of all or any particular varieties of optical and other scientific instruments;

(2) On the effect which the imposition of a duty under Part II. of the Act on goods of the class or description covered by the complaint would exert on employment in any other industry being an industry using goods of that class or description as material; and

(3) Whether in the opinion of the Committee production in the industry manufacturing similar goods in the United Kingdom is being carried on with reasonable efficiency and economy.

The complaint is brought by the British Optical Instrument Manufacturers' Association, Ltd., the British Photographic Manufacturers' Association, the Spectacle Manufacturers' Association, and the Drawing Instrument Manufacturers' Association, and is to the effect that optical and other scientific instruments manufactured in Germany are being sold or offered for sale in the United Kingdom at prices which, by reason of depreciation in value in relation to sterling of German currency, are below the prices at which similar goods can be profitably manufactured in the United Kingdom, and that by reason thereof employment in the industry manufacturing similar goods in the United Kingdom is being, or is likely to be, seriously affected.

At the opening of the inquiry the Chairman called upon Sir Arthur Colefax to submit the case for the applicants and to tender evidence.

Sir Arthur Colefax said that he appeared, with Mr. Stafford Cripps, for the four associations named. He explained the nature of the complaint. The applicants intended to concentrate their case upon a few standard articles which were typical, these including cameras and lenses. After referring to German-made prisms and binoculars, which were sold at something like one-third of the cost of the similar British-made articles, Sir Arthur said that figures as to the cost of manufacture would be given, but it was requested that they should not be made public. He went on to speak of microscopes. British-made microscopes were considered to be superior to anything made elsewhere, but they were absolutely unable to compete with German goods in view of the low prices of these latter. With regard to photographic cameras and lenses, here in respect of cameras British manufacture was at one time supreme, and with regard to lenses, lost ground was being regained at the outbreak of the war. German competition in lenses had been very keen, and had been animated, it was believed, by an ambition to kill the industry in this country, but British enterprise went on maintaining its position. During the war there was an enormous extension of the manufacture of all kinds of lenses, and British manufacturers were in a position to take advantage of the demand. Almost directly after the war came to an end, however, importers began buying cameras in Germany, and selling them here at prices which were little, if at all, in excess of the actual cost of the material, quite apart from the cost of the labour. Sir Arthur then went on to refer to cheap German spectacles. With regard to unemployment generally, manufacturers of cameras and microscopes would state that they were employing less than half the number of workpeople they employed in 1913. It was recognised that this was a period of trade depression, but the opinion of the complainants was that this industry was one not directly affected to the same extent as other industries by bad trade. Sir Arthur concluded by urging that the 33⅓ per cent. duty imposed was insufficient under the circumstances.

At this point it appeared that the application was opposed, but the Chairman said that no notice of opposition had been given.

Mr. Ernest Evans, M.P., said that he was instructed by Messrs. Stikeman and Co. to appear on behalf of a group of merchants and importers. He undertook to give the formal notice which was required.

EVIDENCE.

Mr. Conrad Beck, managing director of R. and J. Beck and Co., optical and scientific instrument manufacturers, was the first witness. His evidence specially related to the sale of microscopes. He produced for the Committee's inspection English-made and German-made instruments, and gave details of the prices. He said that if it was a question of a small amount, they would not ask for protection, but the low price of the German article prevented trade. He gave figures showing the reduction in the number of men employed in his firm since the war. Ordinarily between 2,000 and 3,000 microscopes should be sold each year, and in normal times there was a steady demand. The largest trade was done among medical students, every one of whom should have a microscope. In reply to a question from the Committee, the witness agreed that certain German microscopes, for which about £13 was charged, could not be said seriously to be competing with a first-class English instrument.

The Committee adjourned until Tuesday morning, when the first witness to be called was Mr. Watson Baker, representing W. Watson and Sons, makers of prism binoculars.

When the committee met on Tuesday, the chairman announced that it was proposed to hear as many witnesses as possible that day, and then adjourn to May 31.

Mr. Cripps (for the applicants) asked if Mr. Evans, who had been instructed to object to the application, would indicate the line which would be taken by the opposition. At present the committee was only dealing with five typical cases, but the opposition might bring something else forward.

Mr. Evans undertook to make a statement at a later stage.

Mr. A. Dennis, B.Sc., Works Director, Houghton-Butcher Manufacturing Co., Ltd., of London, was the next witness. He said that his firm made all kinds of cameras and photographic apparatus. During the war the factory was practically completely employed on making special apparatus for the Army and Navy, particularly in connection with aeronautics. Houghtons, Ltd., which had been established for 50 years, owned that factory before the war. The total sales now were about half of those of Houghtons, Ltd., in 1914, although exactly similar cameras were being made. In 1919, before the competition from Germany materialised, there was a great demand for the output of the factory—so great that it was scarcely possible to meet it. A big export business was done formerly, but now the exports were limited practically to one country, namely, Japan. The export trade was only 20 per cent. of what it was in pre-war days. Before the war there were exports to Scandinavia, Italy, and France, but trade had fallen off considerably in those countries, and in Scandinavia, owing to German competition, it had disappeared almost completely.

Asked by the committee how many people were employed in the manufacture of photographic apparatus in this country, witness said that the number was about 20,000, but this included those employed by the manufacturers of sensitized material. He had no definite figures, but the actual number, after making a deduction on account of the employees of plate and film-making firms, might be somewhere about 13,000. He went on to give some details as to the number of persons employed by his own firm, and the reduction which had taken place since 1920; also particulars as to the hours worked per week. In 1913 the working week was 55 hours; in 1920, it was 47. In 1921 80 per cent. of the people employed were working a reduced week of 34 hours. Matters had improved since then, and now 60 per cent. were working the 47-hour week. But in 1913 the whole of the employees, then numbering 855, worked 55 hours.

If the present application succeeded it would have considerable effect on employment. The most formidable German competition was in plate cameras. It was practically impossible to sell an English plate camera, except to a man who was determined to have the English article. The German cameras were not by any means made according to the best methods, and the German plant was not as good as the plant in this country. With fair competition, therefore, it would be possible for British manufacturers to beat Germany hollow in any market in the world. The witness handed to the committee catalogues and lists showing the low cost at which the German cameras were sold. In reply to a member of the committee, he agreed that the present was a period of trade depression, but that was no reason for accepting a position in which the 1922 trade was less than half the 1913 trade. There was good reason to believe that people were prepared to spend money freely on cameras at the present time. The average amateur, especially the beginner, took his film to the nearest chemist to be developed, and the number of spools developed per day had increased fourfold of recent years. That was an indication that there were more cameras in use than ever. Witness would not suggest that the protection sought would eliminate competition, but it would at least offer British manufacturers a sporting chance. They would stand by their goods, and by the organisation that produced them, but they could not face the conditions which obtained at present. Asked why the export trade with Japan had been so well maintained, the witness said that Japan bought the highest class of instrument. It was an expensive camera, but it was being sold in Japan in considerable quantities, more so than before the war.

In reply to Mr. Holmes, who asked if the Germans were putting forward a popular line in plate cameras, the witness said that the plate camera was going out, and the sales every year were less. The amateur who simply wanted to get pictures and did not trouble much about the scientific side of his pursuit, preferred a film camera. Plate cameras, both German and English, were now being fitted to take films. In reply to a question as to the fall in wages and the price of cameras, the witness said that his firm had made all possible reductions in price.

The remainder of the morning was occupied with the evidence of makers of lenses for ophthalmic purposes and of field-glasses.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications May 1 to 6:—

COLOUR PHOTOGRAPHY.—No. 12,618. Colour photography. A. R. Trist.

MAPS FROM PHOTOGRAPHS.—No. 12,398. Photogeodetical production of maps from photographs. M. Gasser.

FILMS.—No. 12,377. Printing photographic films. H. V. Lawley.

FILMS.—No. 12,612. Manufacture of photographic films. Pathé Exchange, Inc.

COLOUR CINEMATOGRAPHY.—No. 12,408. Optical devices for vision or projection of films in colours. A. Keller-Dorian.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

REPRODUCTIONS OF PICTURES ON CURVED SURFACES.—No. 166,513 (July 15, 1920). To enable the pictures drawn on curved surfaces of Grecian vases, which are the only relics of Grecian

FIG. 1.

painting of the classical epoch, to be manifolded by photography, many attempts have been made.

The invention enables curved pictures to be reproduced on plane surfaces with the aid of simple means and at small cost.

Assuming, at first, that only cylindrical or conical surfaces, i.e., envivable surfaces, are to be dealt with, the invention consists in the curved surface being photographed in the ordinary

way, and in then projecting the negative obtained on to sensitive paper wound round a body of the same shape as the curved surface. If the photograph is to be of the same size as the original the body round which the sensitive paper is wound must have exactly the same size as the original body and it must be placed in exactly the same position, and, if the focal lengths of the taking objective and the projecting lens are equal, the distances between the body and the

Fig. 2.

objective on the one hand and between the objective and the negative on the other hand must be the same as the distance between the original body and the objective on the one hand and between the objective and the photographic plate on the other hand. If the scale of the drawing is to be different, the body on which the sensitive paper is wound must be similar in shape to the original body, but it must be correspondingly larger or smaller in size and the distances must be altered accordingly. The process may also be employed for original surfaces curved

Fig. 3.

in two directions, if the curvature in the vertical direction of the body is not excessive. In such cases the body round which the sensitive paper is wound must not be congruous to the original, but must have an evolvable surface which is the particular cylindrical or conical surface that is most nearly similar to that of the original body.

In the drawings, the part *a* to be taken of the Grecian vase selected by way of example has a surface which is slightly

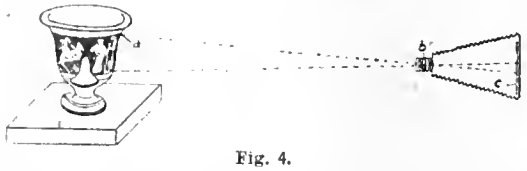


Fig. 4.

concave and tapers toward the bottom. A photographic camera with lens *b* has a sensitive plate *c* placed opposite the surface *a* to be taken. The taking camera is preferably placed at a sufficient distance from the object to get its receding portions as well as its prominent portions sufficiently distinct. The reproduction of the photograph taken is accomplished as follows :—A body *d* is made whose size is the same and whose shape is practically similar to that of the original body. Thus in the

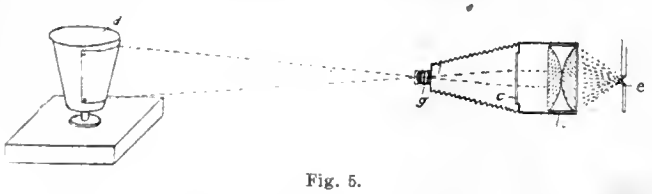


Fig. 5.

example illustrated, instead of a body that is slightly concave like the original, a body with a conical surface, has had to be used. In the reproducing apparatus the negative *c* is illuminated through the condenser *f* by the light *e* and projected through the lens *g* on to the surface of the body *d* round which a sheet of sensitive paper is wound.—Dr. Gottfried von Lücken, 26, Magdeburger Strasse, Berlin.

The following complete specifications are open to public inspection before acceptance :—

Etching Process.—No. 179,137. Process and apparatus for electrical etching. Weeks Photo-Engraving Co., Inc.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

Stands Above All (Stork Design).—No. 421,936. Photographic apparatus included in Class 8 made in Great Britain. William Butcher & Sons, Ltd., Camera House, Farringdon Avenue, London, E.C.4., manufacturers. December 31, 1921.

Stands Above All (Stork Design).—No. 421,937. Photographic papers, mounts and albums included in Class 39 and made in Great Britain. William Butcher & Sons, Ltd., Camera House, Farringdon Avenue, London, E.C.4, manufacturers. December 31, 1921.

MARKS PLACED ON THE REGISTER.

The following marks have been placed on the register :—

Kosmos.—No. 417,223. Photographic plates and films and chemical substances prepared for use in photography. Kosmos Photographics, Ltd., Balfour House, Finsbury Pavement, London E.C.2, manufacturers of photographic papers, plates and apparatus.

Carbine (Stork Design).—No. 421,863. Sensitised films for use in photography. William Butcher & Sons, Ltd., Camera House, Farringdon Avenue, London, E.C.4, manufacturers.

New Books.

The Wellington Handbook.—We welcome the appearance on our table of the twelfth edition of this handbook, by which for many years past Messrs. Wellington and Ward have provided photographers with sound instruction in the ordinary processes of negative making and printing. The text follows the excellently practical lines of previous editions and has an additional introductory chapter, specially addressed to the beginner, on the choice of a camera. There is also a fresh chapter on the Bromoil process, in which detailed instruction in the making of Bromoil and Bromoil transfer prints is given. The handbook also contains the working instructions for the new Wellington Q-Tone paper for prints of warm black colour by direct development either with metol-hydroquinone or with the special M.Q. developer containing borax. For the present edition the publishers have provided a dozen supplemental plates in photogravure from negatives on Wellington Anti-Screen, 'Xtreme and 'Xtra Speedy plates, which admirably convey the high quality of these products. The handbook is issued at the price of 1s. net in handsome cloth binding. It must cost considerably more than this sum to produce.

Registration of Business Names.—The Board of Trade have appointed Mr. Henry Birtles, the Registrar of Joint Stock Companies, and Mr. Arthur Edwin Campbell-Taylor, O.B.E., the Assistant Registrar of Joint Stock Companies, to be Registrar and Assistant Registrar of Business Names respectively.

Copyright in Brazil and Hungary.—In consequence of the accession of Brazil and Hungary to the revised Berne Copyright Convention of 1908, Orders in Council were made on April 21, 1922, under Section 29 of the Copyright Act, 1911, extending the provisions of the Act to Brazilian and Hungarian authors and works. Copies of the Orders may be seen in the Patent Office Library, 25, Southampton Buildings, W.C.2.

New Materials.

Imperial Desensitising Backing. Made by the Imperial Dry Plate Co., Cricklewood, London, N.W.2.

THE IMPERIAL CO. send us a packet of their plates backed with a new D-S backing which they have recently introduced, the title signifying that the backing also acts as a desensitiser of the plate when the latter is placed in the developer. The backing consists of a tough reddish coating, applied in liberal quantity, which we find to be highly resistant to friction or to any abrasion likely to cause a more brittle coating to chip off. But in the case of the D-S backing it is impossible to scratch it off with the finger nail; in fact, even with the use of the blade of a penknife or a sharp point it is not the easiest matter to remove it. Nevertheless, within a minute or so of immersion in the developer the entire coating dissolves away completely, giving a reddish colour to the developing solution. From trial of the plates which we have used, the Imperial ultra-rapid Eclipse, we can fully confirm the claims of the makers as regards the twofold properties of the backing, anti-halation and desensitising. The backing forms a powerful absorbent of the light passing through the plate, and is an extremely efficient preventive of halation. The desensitising dye which enters into its composition permits of development being done in moderate white light after a minute or so has elapsed for the backing to dissolve in the developing solution. Those who habitually work in a dark room will, of course, use the ordinary safe illumination during this first minute, and may then complete development in a much brighter light. It is, of course, inadvisable to take liberties with the reduced sensitiveness of the desensitised plate. It will not do to continue development in the bright light of an ordinary room or within a foot or two of an electric lamp but the boon which the backing confers of developing plates in about the same degree of illumination as is safe for, say, gaslight papers, will be appreciated by everyone who has many plates to develop. Moreover, the amateur worker unequipped with a proper dark room may employ a changing bag or box for the application of the developer, and then after a minute or so remove the dish from this shelter and finish his work in a light of the order of safety which we have just indicated. There is no doubt that this incorporation of a desensitising dye with an anti halation coating, in which the Imperial Company have led the way, will be widely welcomed by all classes of photographers as a further step towards the abolition of the dim light which hitherto has been necessary for the development of sensitive plates.

New Apparatus.

The Apem Vignetter. Made by Amalgamated Photographic Manufacturers, Ltd., 3, Soho Square, London, W.1.

WHILE there have been in the past a fair number of patterns of holders for negative-making vignetting cards, we do not think there has been one which so fully fulfils every requirement as the present apparatus. It is indeed difficult to imagine that in range of movements and mechanical workmanship manufacture of this studio appliance can go further. The holder consists of a metal tube 27 inches in length, which is mounted on a stout metal quadrant so that it can be tilted up or down at about this midway point. To one end of the tube is fitted the square rod on which slide the two parts of the vignetting card. The other end, that placed at the rear of the camera, carries the two milled discs and the milled handle-piece by which the movements of the cards are controlled. The whole appliance can be fitted on either side of the camera stand, for operation by the left or the right hand, as most convenient.

As illustrated in the drawing, and particularly in the two smaller diagrams of the apparatus, the smaller milled disc operates the angling of the vignetting cards. This movement is made by a positive worm connection between a rod running the length of the tube and that on which the cards are mounted. The larger milled head operates the spread of the two parts of the vignetter. This is done by the turning a grooved wheel at the forward end, a catgut band being arranged to give a travel of each part of the vignetting card in opposite directions. The milled handle, shown best in the largest of the three illustrations, turns the whole tube so as to move the rod which carries the cards in a plane parallel to that of the plate—that is to say, this movement puts the vignetter more or less skew-wise, though still parallel, to the plate, and thus provides for vignetting a subject more or less diagonally towards one corner or another of the negative.

The fourth movement is twofold. By loosening the winged nut which normally clamps the tube against the supporting quadrant,

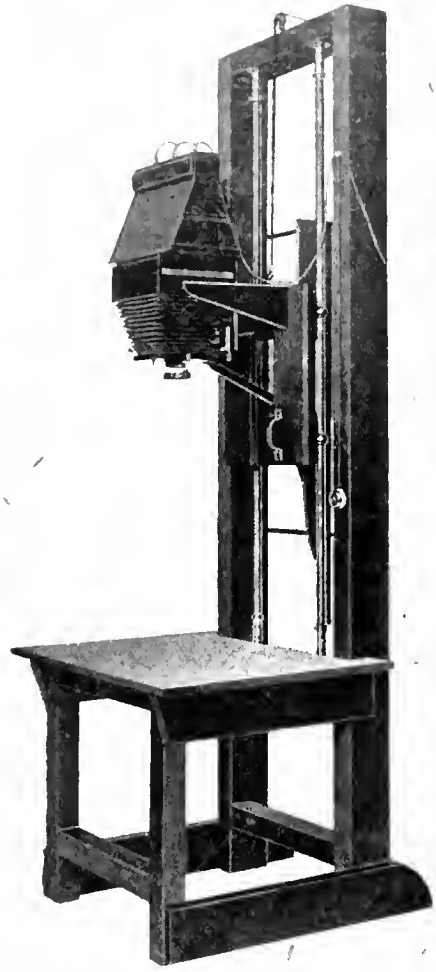
the tube is released for sliding to and fro, and also for raising or lowering the vignetting card, by turning the tube as a whole upon the axis by which it is secured to the quadrant. It will thus be seen that the apparatus most comprehensively includes all the movements which can conceivably be required of a vignetter, and, moreover, allows of these being made with the utmost convenience, and whilst viewing the effect of adjustments upon the image on the focussing screen. It seems impossible that the studio portraitist can ask for more. The apparatus is exceedingly well made in nickelled and blacked metal, and is supplied price £2 17s. 6d.

High-Power Focussing Magnifiers. Made by J. H. Dallmeyer, Ltd., Carlton House, 11d, Regent Street, London, S.W.1

MESSRS. DALLMEYER send us one of the focussing magnifiers which they have recently introduced, and which we find to be an excellent instrument having a magnification of about ten times and a wide field of achromatic definition. The magnifier is mounted in a brass sleeve provided with a screwed collar by which the glasses can be set and kept at the distance from the plane of the object suitable for individual eyesight. The range of movement which is provided for this purpose is three-quarters of an inch. The magnifier is of 1¼ inch diameter and 1½ inches in length when closed. It is supplied price £2.

The Overton Automatic Focussing Enlarger. Sold by O. Siehel and Samuelson, 52, Bunhill Row, London, E.C.1.

This apparatus, which was shown at the recent Photographic Fair, provides the great facility for automatic focussing in making enlargements with the added one of reducing, the latter by disengagement of the automatic device and employment of a hand method of focussing. For automatic work the range of enlargement is from 1½ times to about 6 times, that is to say, enlargements of from 7½ x 5½ inches to 36 x 30 inches when working from a half-plate negative. Half-plate is the largest size of negative which the apparatus takes for enlargement of the whole subject, but the negative stage is so arranged that negatives up to whole-plate in size may be enlarged



The framework and bench of the apparatus is extremely well made, the camera sliding very sweetly on solid steel uprights. By the use of a counterweight the camera is very easily moved, remaining in any given position. The mechanism which automatically adjusts the movement of the lens in relation to the negative in accordance with the degree of enlargement is of a very simple kind, and, as we were able to see from the apparatus at the Fair, accurately keeps the enlargement in focus without any sacrifice of sharpness.

Illumination is by three 100-watt Ediswan Fullolite lamps contained in the sloping chamber seen in the photograph. The bellows has an extension of 24 inches, a length which, with the 7-inch Ross *f*/6.3 Homocentric which is fitted, allows of a considerable degree of reduction when this description of work requires to be done, as in making lantern-slides or copy transparencies from negatives. The floor space required for the apparatus is 4 ft. by 3 ft., and the overall height is 9 ft. The price of the complete outfit is £50.

How the Royal Wedding Presents were Photographed.—The much-talked-of and much-queued-for wedding presents have been photographed, and the "Evening News" tells how the work was done. The producer of the film was Mr. Denison Clift, an American; the lighting experts were French; Mr. Belbuoni, an Italian, was the camera operator; and the rest of the staff of nearly twenty people were British. As there were only about twenty-four hours to spare between the public exhibition of the presents and their removal from St. James's Palace, the job had to be carried out very speedily. Certain permissions had to be obtained to take photographs in the Palace, and a direct order from the King was required to remove the difficulties. The photography of individual pieces of jewellery took four hours, but the work must be worth while as the film will be a unique contribution to British history records. Princess Mary and Viscount Lascelles took a keen interest in the film, and for some time followed the camera from room to room.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SUNDAY, MAY 21.

Hammersmith Hampshire House P.S. Outing to Aldenham.

MONDAY, MAY 22.

City of London and Cripplegate P.S. General Meeting.
Southampton Camera Club. "Chromatics." W. R. Kay.
South Glasgow C.C. Outing to Logan's Well.

TUESDAY, MAY 23.

R.P.S.—Technical meeting under the control of the Scientific and Technical Group. (1) Spectroscopic measurements of the hydrogen ion concentration colour changes in recent indicators, by Leslie F. Davidson, B.Sc.; (2) The dyeing of Silver Iodide with Methylene Blue, by K. C. D. Hickman, B.Sc.; (3) The function of the flash exposure in three-colour work, by E. L. Turner and C. D. Hallam; (4) The Trist three-colour exposure camera, by A. C. Banfield.
Bournemouth Camera Club. Criticism Evening
Cambridge Phot. Club. Exhibition of Winter Competition Prints.
Hackney P.S. "In the Land of the Fells." J. Grice.
Manchester Amateur Phot. Soc. "The Way of the Lovely Sky." A. G. Buckham.

WEDNESDAY, MAY 24.

Croydon Camera Club. "The Evolution of the Hand Camera." A. S. Newman.
Exeter Camera Club. Outing to Shobrook Park.
Hackney P.S. Outing—Westminster to Battersea.
Partick Camera Club. Print Criticism.
Rochdale Amateur Phot. Soc. "Working up a Bromide Print." H. Dawson.

THURSDAY, MAY 25.

Hammersmith Hampshire House Phot. Soc. "A Southdown Ramble." A. H. Page.
Sheffield Phot. Soc. Outing to Loxley Valley.

SATURDAY, MAY 27.

Bournemouth Camera Club. Outing to Swanage.
City of London and Cripplegate P.S. Affiliation Outing.
Dennistoun A.P.A. Outing to Barncluith Gardens.
Hackney Phot. Soc. Affiliated Societies Outing.
Hammersmith Hampshire House P.S. Outing to Hitchin.
Partick Camera Club. Outing to Kilbarchan.
Sheffield Phot. Soc. Outing to Dukeries.
Wallasey A.P.S. Outing to Bidston Hill and Village

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, May 16, the president, Mr. W. L. F. Wastell, in the chair.

Mr. J. F. Shepherd read a paper on "Natural Colour Photography," in which he described the process to which he had given the name Triadochrome. He laid stress upon the correct relative exposure of the three colour-sensation negatives, without the proper balance of which the making of a correct colour print was impossible. In making a Triadochrome paper print from a set of negatives, prints on Transferotype bromide paper were made from the blue-sensation and red-sensation negatives. That from the former was toned yellow, and the other blue, by the ferric iron process. From the green-sensation negative a red pigment print was made on celluloid, and the blue and then the yellow prints successively transferred to it. A paper backing was then applied, and the composite three-colour print transferred to it.

A number of prints by the process were passed round, and aroused a good deal of discussion, the chairman expressing the opinion that the difficulties of making prints by the superimposition of three-colour images were insuperable, and were illustrated in the specimens shown. At the same time he acknowledged the success obtained by Mr. Shepherd within the limits of the process, and proposed a vote of thanks to the lecturer, which was passed by acclamation.

A demonstration was then given by Mr. Traise, of Messrs. Jonathan Fallowfield, Ltd., of a daylight projection screen consisting of ground glass placed ground side towards the audience, the lantern being placed behind. A remarkably bright picture was produced, even with Autochromes, by means of a lantern fitted with an 800-c.p. half-watt lamp. The projection required to be viewed from positions such that the line of vision of the observer formed a fairly small angle with a line at right angles to the screen.

If the position lay much to one side or the other, the picture suffered in brightness. The outfit, however, served excellently for the exhibition of slides in full daylight to small audiences, and the lamp possessed the advantage of being run from any house circuit.

A hearty vote of thanks was accorded to Messrs. Fallowfield and Mr. Traise.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A meeting of the Council took place at 35, Russell Square, on May 12, 1922. Present: Messrs. Marcus Adams, Angus Basil, A. Bennett, W. B. Chaplin, H. A. L. Chapman, Gordon Chase, A. Corbett, W. E. Gray, Reginald Haines, H. A. St. George, George Hana, F. G. Wakefield, W. H. Wedlake, and Halksworth Wheeler, with Alfred Ellis (Secretary) and J. A. Griffiths (Editor). Mr. Alexander Corbett in the chair.

Apologies for absence were read from Messrs. Swan Watson (President), R. N. Speaight (Treasurer), C. F. Dickinson, W. Illingworth, Herbert Lambert and F. Read.

Arising out of the minutes, the secretary read further correspondence in a case in which the proprietors of a small journal disputed liability to pay for the reproduction of a photograph. The matter was left in the hands of the secretary to deal with further. He also reported interviews which he had had with the art editors of two daily illustrated papers concerning reproductions.

The chairman reported on the case of Westminster Electrical Corporation v. Wykeham Studios, in which the judge had deferred his decision.

Mr. Hana read the report of the Propaganda Committee, with regard to which a good deal of preliminary work has been done.

Mr. Marcus Adams brought forward a suggestion by Mr. Barrett that a competition should be organised in connection with the congress for photographs of the best dressed photographer's window or show-case, the photographs in question to be exhibited at the congress. It was left to Mr. Wedlake, on Mr. Haines' proposition, to look into the matter and report to the next meeting of Council.

Mr. Wakefield presented a report on the progress of arrangements for the trade exhibition in connection with the congress. He had had a large number of inquiries as to space and terms.

Mr. Haines raised the question of the admission of the public, and the secretary said the decision of the Council was that the public should be admitted to the trade and photographic exhibition between the hours of 10 and 5.

The chairman said that in Mr. Wakefield's next letter to intending exhibitors it should be made clear that the exhibition would be open to the public. Mr. Wakefield agreed.

Mr. Adams reported with regard to the Foreign Loan Exhibition, that an interesting letter had been received from Mr. Pirie Macdonald, who was doing his utmost to get a fine collection together, as were Mr. Bridgeman, of Vancouver, and others.

Other correspondence related to a dispute over the ownership of negatives, and the Council endorsed the advice which the secretary had tendered to the appealing party.

One member had written about some dry plates which were defective, and one of the Council offered to test and report upon an unopened packet, which the secretary had asked the member concerned to forward.

A member wrote from Lucknow asking advice with regard to the planning of a studio, and the secretary had sent him particulars as to architects and literature, and also a sketch plan of his own.

Advice had also been given to members on insurance policies, the taking out of county court summonses, and in respect to various complaints.

A member having written to ask for a scale of prices for commercial work, Mr. Haines suggested that every member of the Council should be asked to send to the Propaganda Committee his own idea of the scale of charges, which the committee could thereupon average.

Mr. Hana undertook to send out a schedule which members of Council could fill in. It was understood that the prices set down would be those actually realised by the member concerned.

Four applications for membership were considered:—H. Connold, London; C. D. Geddes, Perth; W. Thomas, London; D. Went, Brightlingsea. All were found to be in order.

Mr. Adams made a statement on the Faculty of Arts, which was intended to represent an assembly of everything artistic, and which desired for its photocraft group the support of the Association. The Faculty was anxious that every photographer should become a member of the group, they were now making licentiates, who, in future, would be referred to the group to which they belonged. The group ought to be representative of the Association, the Royal Photographic Society and the London Salon. He added that the Faculty was incorporated last November, and he promised to bring forward a more considered statement on the subject at the next meeting.

Mr. Basil supplemented Mr. Adams' statement. Further consideration of the matter was adjourned until the next meeting.

Mr. Gray initiated an informal discussion on railway rates for photographic luggage, and described recent experiences of his own. He promised that when the matter at issue between himself and the railway company was advanced to a further stage, he would bring it before the Council in a concise form.

Commercial & Legal Intelligence.

LEGAL NOTICES.—Notice of intended dividend is given in the case of James Alfred Derbyshire, artist, photographer and cinematographer, residing at 1, Joldrell Street, Newtown, New Mills, and carrying on business at Goyt Studio, New Mills. Proofs must be lodged on or before June 2, with Archibald Yearsley, 27, Brazennose Street, Manchester.

EASTMAN KODAK COMPANY.—The directors have declared quarterly dividends of 1¾ per cent (being at the rate of 6 per cent. per annum) upon the outstanding preferred stock; and of $1.25 per share of no par value of common stock, payable on July 1 to stockholders of record on May 31.

NEW COMPANIES.

BRITISH DEKO SYNDICATE, LTD.—This private company was registered on May 9 with a capital of £5,000 in £1 shares. Objects: To carry on the business of photographers, producers of pictorial photography, etc., and to adopt a certain agreement, the parties to which are not named. The subscribers (each with one share) are:—E. McBean, 89, Drakefield Road, Brockley, S.E., clerk; W. T. Lock, 3, Winterwell Road, Brixton Hill, S.W., assistant secretary. The subscribers are to appoint the first directors. Secretary: E. McBean. Registered office: 87, Moorgate, E.C.

W. K. SIMPSON & CO., LTD.—This private company was registered on May 9 with a capital of £2,000 in £1 shares. Objects: To carry on the business of manufacturers of and dealers in optical, surveying, nautical, astronomical and scientific instruments of all kinds, chemical and photographic apparatus, etc. The first directors are:—W. K. Simpson, 38, Goddard Avenue, Hull, optician; F. J. Milestone, 7, Marlborough Avenue, Hull, chemical manufacturer. Qualification: 100 shares. Registered office: 38, Goddard Avenue, Hull.

News and Notes.

PHOTOGRAPHIC PITCHES AT HASTINGS.—At the letting of sites on the beach at Hastings last week £1,800 was obtained. The photographic pitches fetched £97.

HEADSTONE PHOTOGRAPHS.—Photographs "blown into glass" and let into grave headstones are now becoming common in American cemeteries, says a news item.

REGISTRATION OF BUSINESS NAMES.—It was stated in a reply given in the House of Commons last week that the number of business men registered under the Registration of Firms Act was 152,335. Fees received amounted to £5,502 15s. 6d. for the year, and expenses £8,900 11s. 7d. It was proposed to increase the registration fees.

DEVELOPING AND PRINTING.—Messrs. W. Butcher & Sons, Camera House, Farringdon Avenue, London, E.C.4, announce a developing, printing and enlarging service for the amateur film trade. A price list of charges for circulation among dealers' customers is obtainable and can be had with the name and address of the dealer printed thereon. A special wallet for the supply of negatives and prints has been designed. Messrs. Butcher will send full particulars of this service to dealers and others interested in the D. and P. business.

PHOTOGRAPHING WASPS.—Mr. F. Martin Duncan, lecturing before the London Zoological Society last week, showed upon the screen a "close up" picture of a wasp's head which filled the entire screen. Another picture showed a wasp eating honey from the back of a lady's hand. Wasps, said Mr. Martin Duncan, were perfectly harmless, and made no attempt to sting if you were quiet and gentle in your movements. All his photographs, which also included studies of wasps building their comb and of young wasps being hatched from their cells, were obtained without a single sting.

A 500 EXPOSURE CAMERA.—According to the "Newcastle Chronicle" a camera has been invented which will take photographs or films, develop them, fix and chemically dry them—all inside 120 seconds. Mr. E. B. Hayes Fratze, who is closely connected with the invention, has stated that the new camera is slightly larger than the ordinary autographic camera, and the whole thing is worked by a secret chemical process. The camera and contents are practically indestructible, and 500 to 1,000 pictures can be taken without renewing the contents. It is hoped to put the camera on the market at a competitive price, and also to make it exclusively a British product.

A NEW PRESS-PHOTOGRAPHY RECORD.—Rush in Press photography is common enough to-day, but the greatest rush of all was that of getting into the London morning newspapers of the 9th inst. reproductions of photographs of the arrival of King George V. and Queen Mary in Brussels on the previous evening. Photographs of the King's arrival were taken by a Press photographer at 5.22 p.m. at Brussels, and the undeveloped plates were rushed to Evere aerodrome, just outside the city, where they were put on board an aeroplane. A motor-car was waiting at Croydon aerodrome to convey the plates to the London newspaper office. There was also a motor-car waiting at Lympne aerodrome, Kent, in case the aeroplane coming from Brussels was compelled to make a forced landing. The aeroplane started at 5.40 p.m., and arrived at Croydon at 8 p.m., covering 202 miles in 1 hour and 55 minutes, and travelling at an average speed of over 105 miles an hour. The plates reached the London offices at 8.40 p.m. Never before, we believe, have photographs taken in a foreign country at such a late hour been published in a London morning newspaper on the following day. This in itself is a great feat; but, in addition, it was arranged that the special edition containing these photographs, with their titles printed both in French and English, and the description of the arrival also printed in both languages, should be sent off by aeroplane to Brussels very early in the morning.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

D. W.—If you write to Messrs. Winsor & Newton, 37-40, Rathbone Place, London, W.1, they will send you a reprint of a very good article on colouring lantern slides, for which work they supply the best colours and brushes.

B. J.—Yes, the postcard is printed from a half-tone block. Messrs. Hood & Co., Sanbride Works, Middlesbrough, or Messrs. Hamel & Co., Premier Studios, Palmerston Street, Woodborough Road, Nottingham, supply blocks of this kind.

R. K.—We have no experience in the use of Arctic glass for studio glazing, but provided that it is not of a decidedly green or yellow tint it should answer very well. It is more usual to employ "rolled plate," which we think would diffuse the light more evenly.

S. H.—Effect of sulphur toning is somewhat uncertain, that is to say, it works well with some papers and not with others. We advise you to take the advice of the makers of the sensitive cards which you will be using. About the average formula is that in the Almanac.

M. H.—Two and a half years is a long time for keeping bromide paper under ordinary conditions of storage. We do not suppose there is any ground for thinking the paper was originally defective, and we do not think that there is anything which you can now do to render it perfect for use.

W. H.—If you mean that you should follow up the matter by taking any kind of legal action, we advise you to think nothing more about it. The issue is very doubtful. Most probably the judge would say that it was a matter which was not of sufficient importance to be brought before the Court.

N. F.—The value of old engravings is out of our province. You might get the information from the "Art Trade Journal," 13, Buckingham Street, Strand, London, W.C.2, or you might send the map to Messrs. Maggs Bros., 109, Strand, London, W.C.2, asking them to make an offer for it. They are a very old and reliable firm in the old print trade.

J. M.—The "Photo-Miniature" is issued in this country by Houghtons, Ltd., 88-89, High Holborn, London, W.C.1, from whom you can obtain a list of the comparatively small number of issues which are in print. We are afraid if you want copies of any of the older numbers you will have to write to the American publishers, Messrs. Tennant & Ward, 103, Park Avenue, New York, and probably they have only a few of the older numbers in print.

E. R.—(1) It is difficult to assign a value to the Shepherd lens, as it is entirely dependent upon its quality. If genuine and in good condition it is worth from £2 10s. to £3 to a private purchaser. (2) The Dallmeyer lens is by the number a very early one; its current value, according to condition, is from £4 to £6. (3) Messrs. Sands, Hunter & Co., 37, Bedford Street, Strand, London, W.C.2, might have a flange in stock to fit the Shepherd lens. If not, they would adapt one for a few shillings. You need only send the racking jacket for fitting.

M. D.—We are afraid that in the absence of very complete particulars of the method which is used it is not possible to say what is the cause of difficulty in obtaining uniform sepia tone. We suppose that you refer to the hypo-alum process. Certainly variation in exposure of the paper and also in the degree of development has an effect as regards causing variation of tone, but we do not think that these factors would upset matters to a material extent, that is to say, if exposure and development are reasonably right. It is very doubtful if a particular formula for the hypo-alum bath will help matters, but we may refer you to that on page 773 of our issue of December 30 last. Our experience is that during the last year or two, probably as the result of differences in the gelatines which are used, there is greater difficulty in obtaining uniformity of hypo-alum tone. We should think that your best course would be to obtain the help of the makers of the paper.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. PRICE FOURPENCE.

TERMS OF SUBSCRIPTION POST FREE.

UNITED KINGDOM OR CANADA.—*One Year*, £1 1s. 8d.; *Six Months*, 10s. 10d.; *Three Months*, 5s. 5d.

ANY OTHER PART OF THE WORLD.	*One Year*	£1 3s. 10d.
	Six Months ...	12s. 0d.
	Three Months	6s. 0d.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibits the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3238. Vol. LXIX. FRIDAY, MAY 26, 1922. Price Fourpence.

Contents.

SUMMARY.

In the King's Bench Division of the High Court on Monday last, May 22, Mr. Justice Swift delivered his reserved judgment in the action brought by the Westminster Electric Supply Corporation, Ltd., against Wykeham Studios, Ltd., in which the issue was the right of the electric company to supply current at a power rate greater than the power rate at which it was supplied to other consumers. Judgment was for the plaintiffs. (P. 314.)

In a leading article we deal with the judgment in the above case. One part of it, which is a point to the good, is the ruling of the Court that current supplied for studio arc lamps is current supplied for power purposes. As regards the right (which he held the electric company to have) to supply current for power at a higher rate than that granted to other consumers, the learned judge based his decisionson the alleged greater intermittency of the consumption of current in a studio as compared with that of other users of current for power purposes. (P. 306.)

In the paper this week of the series dealing with the business side of professional photography, "Pelham Swinton" describes a system of ascertaining the cost of photographs produced under the conditions prevailing in a portrait business. The system is based on the average proportional costs for a given output of prints, and provides the means of showing the differences as regards profit between different styles and also of disclosing the fluctuations of cost due to the ups and downs of the number of portraits sold by the studio. (P. 307.)

Mr. Robert Dykes draws a lurid picture of the conditions under which photography has to be done in exploration work in tropical West Africa, and particularly emphasises the necessity of the inclusion of a portable dark-room in the outfit. (P. 310.)

The report of the Eastman Kodak Co. for the year ended 1921 shows net profits of £2,903,424, a reduction of nearly £920,000 on those of the previous year. The hundred dollar ordinary shares are to be split, each into ten shares of "no par value." (P. 314.)

The many interesting studies in natural history which may be made at night by means of flashlight was the subject of a recent paper at the Royal Photographic Society by Mr. Oswald J. Wilkinson, whose flashlight photographs recently received the Society's medal. (P. 311.)

A note referring to a vacancy on the editorial staff of the "British Journal" will be found on page 306.

Mr. Pirie MacDonald is to form one of the R.P.S. selecting committee in the pictorial section. (P. 319.)

Mr. W. L. F. Wastell invites suggestions for the form of the Fox Talbot Memorial. (P. 319.)

Hints on the making of the amidol developer and on preparations for a water shortage will be found in "Assistants' Notes." (P. 316.)

EX CATHEDRA.

The Costing of Portraits. The chapter which appears this week in the series by "Pelham Swinton" on the business side of portrait photography deals with a branch of studio accountancy which our correspondence regularly shows us to be greatly neglected. In comparison with scores of requests for advice on the price which should be charged for certain work, we cannot remember one which disclosed the existence of any system in use for ascertaining the cost of photographs and therefore the charge required for a given ratio of profit. The fact that competition may often determine the charge to the public does diminish the value of a trustworthy costing system. Nevertheless, it is an argument for the more general adoption of a method which should benefit photographers generally by disclosing the unprofitable nature of work the charge for which is unduly "cut." To many, perhaps, the system as set forth by our contributor may have a forbiddingly intricate appearance, and suggest an amount of labour out of proportion to its benefits. Many, at a first glance, will be inclined to put it aside and continue on the time-honoured lines of leaving things to chance. Therefore, we may underline the recommendation which our contributor makes by pointing out that the system consists of two parts: (1) the establishment of average proportional costs as ascertained for a known output, and (2) the application of these costs to a particular job. Part No. 1 having been worked out for a sufficiently long period remains valid so long as the cost items and the output remain approximately the same. Hence the system reveals anomalies in the differences between cost and price of various styles of portrait. But, more than that, it allows of the considerable fluctuation of cost consequent upon variations in output to be quickly ascertained, forming a danger signal of the direction in which profits are tending.

* * *

The Kodak Report. The difficult economic conditions which prevailed in almost every country of the world during 1921 are reflected in the report of the Eastman Kodak Company, issued last week. The profits earned by the parent or subsidiary companies show a reduction of about £900,000, as compared with those of the previous year. Nevertheless, they reach the respectable total of £2,903,425, and must be considered in reference to the fact that 1920 was the most prosperous year in the history of the Company. The falling off is no doubt due to the lesser prosperity of the cinema industry, since the making of cinematograph negative and positive film is the major part of the Company's business, and one which, it is supposed, exceeds all the others put together. The report discloses a very strong financial position in the high ratio of cash and other assets to the issued capital and current liabilities. As has been the case in the balance sheets for years past, goodwill and

patent and trade mark rights stand at nil among the assets. It is announced that each $100 ordinary share is to be split into 10 "of no par value," a unit of capital which, we confess, is unfamiliar to us, and of which the circular letter of Kodak, Ltd., does not provide an explanation. Shareholders, however, have had such good reason to be satisfied with the financial results in the past that they may feel assured of benefit to themselves from the present share-splitting scheme. Of late years the Rochester factories have undergone great expansion, so that the Company is in a better position than ever before to increase its earnings on a scale commensurate with the economic recovery of countries on the continent of Europe and in the western hemisphere.

* * *

Patching the Gelatine Film. As a rule when a negative exhibits defects due to mechanical damage of the film, the custom is to hand it over to the retoucher for spotting out with water colour. If the defect is of appreciable size this is by no means an easy job, and, therefore, it may be of advantage to call attention to the facility with which in some circumstances a negative may be patched with part of the film taken from another. Dependent upon the character of the subject a tear in the gelatine film may be made good by using a bit of film of equal density from another negative. The required patch is cut out with a sharp knife and the negative containing it well soaked in water. By means of a little hydrochloric acid the patch can be detached, washed and applied to the damaged negative with a fine camel hair brush. Very little touching of the negative is then required to make good the damage. It might be thought that the above is a rather difficult operation, but a steady hand and some experience in judging the density of the applied patch will determine its successful use.

* * *

A Post on the "B.J." Since some of those likely to be interested may not be in the habit of looking at the announcements of vacant situations, we may be excused for drawing attention to the advertisement on another page by the publishers of the "British Journal" for an assistant editor. While this advertisement appears also in several of the daily newspapers, we think we may expect to receive applications from those familiar with the "B.J." as regular readers of it. Naturally, a knowledge of photography and the ability to write good plain English are two essential qualifications, in respect to which applicants should submit evidence. It is also asked that applicants should give particulars of employment during, say, the past seven or eight years, including war period, and that letters should not be addressed to any individual members of the staff, but to the publishers, Messrs. Henry Greenwood & Co., Ltd.

* * *

A Scientific Instruments' Journal. From the Institute of Physics comes the proposition to establish a monthly journal dealing with methods of scientific measurement and with the theory, construction and use of measuring instruments. A preliminary number has, in fact, been issued, showing the proposed form of the journal and, as well as can be done in a single issue, the field which it will cover. In an introductory note Professor J. J. Thomson emphasises the usefulness of a journal of this kind, of which there has hitherto been no representative in the English language. It would seem that the projected publication will, in a measure, follow the lines of the "Zeitschrift für Instrumentenkunde," a journal which in the past has published many notable contributions to technical optics. At a price of 2s. 6d. per issue it is estimated that with a circulation of about 1,000 there will be a deficit of some £2,000 per annum, whilst a circulation of about 3,000 will render the journal self-supporting. The promoters are, therefore, anxious to ascertain as accurately as they can the probable circulation, and those who will become subscribers are asked to notify their intention to the Institute of Physics, 10, Essex Street, Strand, London, W.C.2, from which address they can no doubt still obtain copies of the preliminary number which has been issued.

CHARGES FOR STUDIO ELECTRIC CURRENT.

JUDGMENT has now been given in the action brought by the Westminster Electric Supply Corporation, Ltd., against Wykeham Studios, Ltd. On Tuesday last, May 22, Mr. Justice Swift decided in favour of the electric company, and thus disappointed those who hoped that the case might establish the principle that consumers, such as photographers, are definitely entitled, under the Electric Lighting Act of 1882, to the supply of current at a "power" rate at least as favourable as that allowed to other consumers. Nevertheless, although this hope has not been realised, the judgment, so it seems to us, is not altogether without benefit to photographers in efforts they make to obtain terms for the supply of current at power rate as advantageous as those granted to other consumers. We may therefore endeavour to show the issue which has been raised and decided in the case when divested as far as possible of its legal technicalities.

The circumstances of the dispute have already been described in our issue of May 19 last, pages 297-298, and are recapitulated in the judgment reported on another page. Broadly, the Wykeham Studios, Ltd., after having been supplied with current for their arc lamp through a separate meter at the ruling power rate, disputed the right of the Company to continue the supply only at first at the full lighting rate and afterwards at a rate less than this latter, but greater than the power rate. They contended that they were entitled to a supply of current at the same power rate advertised by the Company and paid by other consumers. Now, in reference to both these arguments the learned judge did definitely hold that the current used by the defendants was used by them for power purposes. It is something to have obtained a judgment on this point, namely, that current used in studio lamps, as distinguished from that used for ordinary lighting, is current used for power purposes according to the electric lighting acts. Unfortunately, that does not end the matter so far as the dispute is concerned. The question remains whether an electric light supply undertaking has the right to vary its charges for current for power purposes. May it charge one consumer 1½d. per unit, another, 4d. per unit, and a third even as much as the full rate permitted for ordinary lighting? The Company claimed that in fixing the defendants' power rate at 4d., whilst supplying other photographers in the area at the same rate, they were not infringing the sections in the Electric Lighting Act of 1882, which enforce uniformity in the terms of supply and prohibit preference to one consumer in comparison with another. It is in reference to the Court's interpretation of these sections in their application to photographic studios that the judgment is of chief importance.

These sections in the Act are as follows:—

19. Where a supply of electricity is provided in any part of an area for private purposes, then, except in so

far as is otherwise provided by the terms of the license, order or special Act authorising such supply, every company or person within that part of the area shall, on application be entitled to a supply on the same terms on which any other company or person in such part of the area is entitled under similar circumstances to a corresponding supply.

20. The undertakers shall not, in making any agreements for a supply of electricity, show any undue preference to any local authority, company or person, but, save as aforesaid, they may make such charges for the supply of electricity, as may be agreed upon, not exceeding the limits of price imposed by or in pursuance of the license, order or special Act authorising them to supply electricity.

The Act of 1882, like many other statutes, is pleasantly vague in its terms. What are the "similar circumstances" of Sect. 19 and what is "undue preference," mentioned in Sect. 20. The Act does not say; it leaves it for the Courts to define these matters in the course of expensive litigation, and Mr. Justice Swift reviewed the several cases in which these questions of preference and similarity of circumstances had been the subject of legal decisions. It may be said that these decisions are in agreement in regarding as similar such circumstances of consumption as are alike in the variations they cause in the load upon an electric company's generating station. Obviously, it is inconceivable that the consumptions of even two customers can be exactly similar as regards amount of current, duration of its use, and intervals of disuse. Such a coincidence of three variable factors is a practical impossibility; the mathematical laws of chance make it so. For this reason it is a manifest absurdity to expect similarity of circumstances in greater degree than a rough approximation. Yet, when the learned judge proceeded to apply this doctrine to the facts of the present dispute, he appeared, so we think, to contrast conditions of electric consumption in photographic studios with those in the establishments of other users of current for power purposes in a way palpably out of relation with the facts. Other manufacturers, he held, consume current regularly; photographers, intermittently. At the hearing he appeared to be of the view that in a photographic studio current is used in sudden bursts, like flashlight, and it was rather unfortunate that evidence contradicting this view was not given. But apparently, on this impression it was held that because of this intermittency an electric supply company is entitled to charge photographic studios more for current than it charges other users of current for power purposes. If that, as we think, is the essence of the judgment, electric companies are welcome to all the satisfaction they can get out of it. In future cases it will require to be shown that a studio takes current under a greater variation of load than other consumers if it is to be charged more than those consumers. Apparently, an instrument recording the variation of load on a kind of indicator diagram is a device which is necessary for securing non-preferential treatment of photographers in comparison with other users. The particular use to which the current is put has nothing to do with it. Such, it seems to us, is the position into which the question has been brought by the present judgment. That current for studio lighting has been held to be current for power purposes is a point to the good; the question of similarity of circumstances in future cases must rest on the evidence.

In conclusion, a word deserves to be said on the public spirit exhibited by the directors, Messrs. Emus & Prout, of Messrs. Wykeham Studios, Ltd., in making the question a test action. The amount at issue was not large, and their aim was to establish a case for the supply of electric current to photographic studios at as low a rate as for other power purposes. Although judgment has gone against them they have, nevertheless, scored certain points. Their case was no doubt weakened by the Professional Photographers' Association's acceptance of the Company's offer of 1d. per unit, which figured among the arguments of counsel for the plaintiffs.

THE BUSINESS SIDE OF PROFESSIONAL PHOTOGRAPHY.

[Many photographers, we are afraid, go for years in happy, or, it may be unhappy, ignorance of the cost of producing a dozen portraits of a given size. The technicalities of costing form a branch of commercial accountancy which probably in nine studios out of ten is shirked altogether. Nevertheless, it is a part of the business management of a studio which is of prime importance, and particularly so under fluctuating conditions. The practice of a systematic costing system on the part of the photographer may be compared with the taking of an X-ray photograph for the surgeon who is to carry out an operation. Both reveal a condition of things which is not apparent on the surface. We venture to think that the present chapter by "Pelham Swinton" on this subject is the most valuable because the most needed of the series of papers which, as we hear from many quarters, has aroused widespread interest among photographers and some speculations on the identity of their author. Previous articles have been:—"The Economic Position of the Photographer" (April 28), "The Photographer and His Client" (May 5 and 12); "The Photographer's Clerical System" (May 19). The remaining paper will be:—"The Art of Account Collecting."]

IV.—THE PHOTOGRAPHER'S COSTING SYSTEM.

I TAKE it for granted that all photographers, however humble, possess a cash book which they balance every day, and that, at the end of each month, they draw up for their personal information a statement of their turnover and expenses for that period. It is not necessary here to discourse on the various methods of keeping such books, and the mysteries of double-entry, as such things are common to all kinds of business; and if there be any photographer who is ignorant of these simple modern processes, the nearest accountant will set him right in half-an-hour.

I take it for granted also that the average photographer makes a monthly or annual analysis of these totals, dividing up his turnover under different headings, such as Studio Portraits, Commercial Work, Enlargements, Colour Work, Frames, etc., etc.; his material costs under such classifications as Plates, Papers, Mounts, and Chemicals; and his working expenses under Rent, Salaries, Repairs, Postages, Coal and Light, and so on. I presume all this in order to save space, and because if a photographer possess not the elementary information which such analysis affords him, he is walking

in a darkness even greater than that of his darkroom—for there is no light in that darkness.

There is, however, another form of analysis which the photographer should employ, and from which he can deduce, as nearly as is necessary, the cost of those commodities which he daily produces and which he sells to a grateful public at a price. When I speak of the cost of photographs I do not refer merely to the cost of the materials employed. This is but a fraction of the total cost. Nor do I include merely the cost of the materials, plus the direct labour involved—but also such things as rent, rates, insurance, postages, packing materials, clerical labour, cleaning costs, electricity, coal, law and accounting charges, and the redecorating of the reception room last spring.

Costing systems employed in factories and elsewhere are usually of a highly complicated nature, involving the necessity of a time-sheet for each job undertaken, to be filled in and checked as the order progresses. Fortunately for the photographer, such intricacies are unnecessary, the work which he produces being more or less of a standardised nature. Photographs are produced in standard sizes, with standard materials, and, for all practical purposes, it may be taken that the labour involved in the production of one portrait is the same as that of another. Of course, it is admitted that one negative may require more retouching than another, and that two prints may occupy very different quantities of skill and time on the part of the same finisher; but, in estimating costs over a month or a year, these variations may be overlooked, and an average time or cost be accepted.

This applies also to the time spent in operating, the extra time expended over the difficult sitter being balanced by the ease in photographing the good one. And, as far as printing and mounting are concerned, it may be even more readily accepted that it takes little more time to print and mount a large photograph than a small one. Finally, as regards the clerical expenses, it is just as easy to put a large order through the books as a small one—and considerably more enjoyable.

Thus, if a photographer possess figures which show the total working expenses involved in the running of his printing room for a period of twelve months—including the rent of the room, the proportion of taxes applicable to that rent, the wages of his assistants in that room, the cost of replacing dishes, bottles, etc., during the year, the proportion of cleaning expenses, of heating and lighting, and a certain portion of his own salary for supervision—then he has but to divide that total sum by the number of prints which that room has produced during the same period in order to arrive at the figure which it costs him to make one print. If, then, he requires to know what is the cost of making a cabinet print, it is necessary only to add to this the net cost of a piece of cabinet paper.

Similarly, he may work out the cost of mounting the print, finishing the print, and dispatching it. Then, with regard to the other processes, he may discover how much it costs him to photograph a customer—by dividing the cost of the operating department, which consists of the greater part of his own or an operator's salary and the rent, rates and upkeep of the studio and darkroom, by the number of sitters taken during that year. Similarly, he calculates the cost of retouching by dividing the retoucher's salary, etc., by the number of negatives retouched. Finally, by the same methods, he will learn what it costs him to record an order and send it through the books, and what expense is involved in dispatching it; while the cost of receiving a customer, showing her first to the dressing-room, and then to the studio, he will find to be quite a formidable item.

Having acquired all this information, it behoves the photographer to put it to a practical use; and the first thing he will do is to ascertain the cost of the production of a dozen cabinets, commencing with the reception of the sitter, and including the taking of the photograph, the completion of the order, and the postage or delivery thereof. He will then learn, for the first time, whether the price which he charges for all these services is sufficient to yield a comfortable profit, or whether he has been living for years a life of unconscious philanthropy.

To ascertain this rather important fact, he has but to add together the results of his previous deductions, thus:—

	s.	d.	s.	d.
Reception Dept.—Cost per sitter during year			2	6
Operating Dept.— Do. do.	12	0		
Add—6 plates at 4d. ...	2	0		
			14	0
Retouching Dept.—Cost per negative, 1s.; three negatives			3	0
Printing Dept.—Cost per print, 8d.; 12 prints	8	0		
Add—12 pieces paper ...	1	0		
			9	0
Mounting Dept.—Cost per print, 2d.; 12 prints	2	0		
Add—12 mounts	3	0		
			5	0
Finishing Dept.—Cost per print, 6d.; 12 prints			6	0
Clerical Dept.—Cost per order during year ...			2	6
Dispatch Dept.—Cost per parcel during year (including postage and materials)			2	0
Total ...			£2	4	0

Now this gentleman has probably been in the habit of supplying cabinet portraits at £2 2s. per dozen, and of exclaiming continually at the unlucrative returns of photography as a profession. These figures, although fictitious, are in no way exaggerated, as they are considerably below those which have been arrived at in connection with my own firm.

In order to calculate the cost of a re-order, the same process is employed, but omitting, of course, the operating and retouching costs. Similarly, in the case of a "copy," the cost of the copying department is substituted for that of the operating department, and divided by the number of copies done during the year. As the retouching department deals with copy negatives, as well as those taken in the studio, the cost of this department must be divided by the number of studio negatives *plus* the number of copy negatives. To arrive at the number of studio negatives retouched during a year, it is necessary merely to multiply the number of sitters by the number of proofs which it is the custom of the firm to supply to each client. Again it is admitted that this is only a rough rule by which to calculate a cost; but it is averages with which we are dealing, and, if the photographer is content to charge a fixed price for a certain size of portrait, irrespective of the physiognomy of the sitter, or—within limits—of the nature of the copy or enlargement—he cannot cavil at the acceptance of a flat estimate of costs for the retouching of these negatives. Nor has he need to do so. The only alternative is the elaborate time-sheet; and, in my opinion, this would be merely to use a sledge-hammer to crack the nut.

The photographer who had been charging £2 2s. per dozen for portraits which, on the average, were costing him £2 4s., may still have been able to show some profit at the end of each year, the loss on the cabinets having been balanced by a substantial profit on whole-plates, enlargements, etc. But it is not a state of affairs out of which he could hope to immerge into opulence. If his staple line were whole-plates, however, on which he made a good profit, and cabinets were merely a subsidiary consideration in his business, then he would have no cause for anxiety. For the interesting factor of this aspect of photography is, that, as the overhead and labour costs involved in the production of a dozen whole-plates are barely any greater than those of a dozen cartes, the only

saving in the production of smaller sizes is on the materials employed. Thus, as the photographer must charge considerably less for a smaller size of portrait—for the inflexible reason that the public will not have it otherwise—he cannot avoid a financial loss on at least one size. But the important point is—that the photographer cannot afford to bear such a loss *on his staple or most popular line*. In other words, he must see that his best selling size is in no need of subsidisation out of the profits of other sizes, and that this line stands alone as an economic proposition.

While the public insist on paying very much less for carte portraits than for cabinets, although the cost of production is very little less, they are willing to pay considerably more for whole-plate portraits, despite the fact that the cost of making these is very little more. The whole-plates should yield a sufficient profit to justify their own existence, as well as sufficient to balance the loss on the cartes; while the cabinets should neither give nor receive excess profits. This, of course, is in a business where cabinets are the staple line. The suggestion may be made that the smaller sizes should be abolished, since they involve a loss. Such a course would not be profitable in the long run. The photographer cannot afford to refuse custom, for it is always possible that the carte sitter of to-day may be the whole-plate customer of next year. Besides this, it must not be forgotten that even a carte order helps to pay part, if not all, of its proportionate labour and overhead charges, and increases the firm's expenses only to the extent of a few shillings' worth of materials.

The chief object of the photographer's costing system therefore is to ascertain, from year to year, that his principal size of studio portrait, and his most popular size of enlargement, are being sold at a profit, and that the loss on the smaller sizes is made good by the extra profit on the larger. Further, when called upon to do an unusual job for which he has no fixed price, he has but to refer to his costing figures to learn the price which he should charge. It is obvious that if the photographer can arrange his prices in this manner he will extract from his business annually the maximum revenue that is to be obtained therefrom, and which, I presume, is an object near to his heart. He need have no fear of elaborate books and long hours of clerical work, for the employment of this system involves only one book, and an expenditure of time varying only from two to ten minutes daily.

All that is necessary is a cash book sufficiently long to contain entries for each day of the month on one page, and with fourteen money columns across the double page. There is a standard size made in this pattern. The fourteen columns are headed as follows:—Reception Dept., Operating Dept., Copying Dept., Retouching Dept., Printing Dept., Mounting Dept., Finishing Dept., Dispatch Dept., Clerical Dept., Number of Sitters, Number of Prints, Number of Copies, Number of Parcels, Number of Orders. One double page is used for each month, the dates being written down the left-hand side of the first page.

Let it be understood that by "department" is not meant necessarily a suite of rooms, nor even one room. These divisions are purely nominal, and if, as is probable in many cases, the touching, retouching, and even mounting, are performed in the same room, and by the same people—then the expenses of each of these three departments consist of one-third of the rent of the room, the salary or part-salary of the persons employed in each process, and a proportion of cleaning expenses, coal, light, etc., repairs and renewals being allocated to the department for which they were executed. Thus, if Miss Brown is in receipt of £2 10s. per week, and she is employed during the greater part of the day in retouching, but assists Miss Smith in finishing, her salary may very properly be allocated thus: Retouching Dept., £2; Finishing Dept., 10s. Miss Jones, on the other hand, does all the mounting, but she assists both Miss Brown and Miss Smith in her spare time. Her salary, if she receive, say, £1 15s. per week, may be distributed in this manner: Mounting Dept., £1 5s. Retouching Dept., 5s.; Finishing Dept., 5s.

The important point to be observed is that entries must be made in the various columns *daily*. If such things are postponed for a few weeks, they become a burden; and those photographers who are the proud possessors of that mental defect prettily termed an "artistic temperament" must be on their guard. Each morning, therefore, the photographer glances at the cash book of the previous day, and he finds, possibly, expenses such as the following:—

By stamps	£0	10	0
„ coal	2	10	0
„ repair to copying camera ...	1	7	6
„ pencils	0	0	6

He should keep two stamp drawers—one for parcels and the other for letters and receipts. Thus, if the item of 10s. is for parcel postage, this sum is entered in the Dispatch Dept. column. Then comes £2 10s. for coal. How many fires has he? Five. Very well, that is 10s. per fire. Where are these fires? One is in the finishing and retouching room, one in the mounting room, one in the studio, one in the reception room, and one in the dressing room. Five shillings, therefore, goes against the Finishing Dept., and 5s. against the Retouching; 10s. against the Operating Dept., 15s. against the Reception Dept., and 5s. against the Clerical Dept. The Reception Dept., it will be noted, is debited with the dressing-room, plus one half the reception-room costs, as the clerical work is also carried on there. The item of £1 7s. 6d. for repairs goes under the Copying Dept. column, and the 6d. for pencils, of course, under the Clerical Dept.

The photographer then refers to his day book, and notes, under the respective columns in his costing book, the number of prints and the number of copies entered on the previous day, as well as the number of orders completed. His receptionist tells him how many parcels she dispatched on the previous evening, and he enters this figure, as well as the number of sitters whom he photographed. That is all that is required for that day; and at the end of the month he adds up the columns. These totals being added at the end of the year, a few simple division sums will reveal all the information which he desires.

There are one or two details which must be noted. Material expenses, of course, are not entered in this book; the material costs being easily calculable for any size or quantity. On the other hand, materials such as chemicals should be entered under their respective departments, as these items are spread over the production of all negatives and all prints, and are similar in consequence to an overhead cost. The proportion of rent per room is best arrived at by discovering the rent per square foot of floor-space over the whole premises, and allocating it according to the dimensions of the room in which the "department" is placed. Rates and taxes, of course, are apportioned at so much per pound of rental. Cleaning costs, insurances, and lighting can be split up among the departments in equal proportions, unless there exist any kind of apparatus which consumes more than an ordinary amount of current, or articles which require more than a usual insurance premium. The Clerical and Dispatch Depts. must not be confused. Under the first are entered notepaper, pens, pencils, ink, letter stamps, etc., and under the second are classified packing board, parcel paper, string, sealing wax, parcel stamps, and so on.

The whole scheme involves a certain modicum of common sense, and each business and each circumstance must be considered separately. Thus, one photographer may find it necessary to add a Commercial Work Dept., and many will find a Colour Work Dept. an essential. Whatever the photographer may do, however, he must allow an adequate salary for himself. Even although he own all the business, it is obvious that what he calls "profit" cannot be so until he

has deducted a sum which he would reasonably require to pay for a competent operator-manager to fill his place in the event of long illness, or that which his trustees would require to pay in the event of his death. In the event of his becoming too successful this constant reminder of his mortality will serve to keep him humble. His salary, real or imaginary, he should allocate among the departments, the largest portion under the operating department, and the remainder in equal portions among the others as expenses of direction and supervision.

The costing figures for the past year form the basis for the future. If business proves to be much the same as during the previous year, then the photographer knows that his costs will remain similar; but, if business decreases to any extent, and sitters come in much fewer numbers, then let him beware. For the most important fact to a professional photographer in difficult times is this, that the overhead and labour costs are so large a part of the total expenses that during a time of depression the average cost per sitter, per print, per enlargement, and for each of the other processes, soars at so alarming a speed that the business may be well-nigh overwhelmed before its owner is aware of the danger. During such a period, the photographer should strike his costs at short intervals, and the consecutive results will show with an undeniable vividness the precise time and place for drastic economies.

A mere knowledge that his profits are sadly reduced is of little utility at such a time. He is merely in the position of a surgeon who is aware that his patient is suffering from some organic disease, but is ignorant of its nature and whereabouts. If the patient's life is to be saved, the surgeon must know immediately where to insert the knife. In times such as the present the photographer must ever watch over his business, knife in hand. And a costing system is his only sure means of diagnosis.

PELHAM SWINTON.

PHOTOGRAPHY IN TROPICAL WEST AFRICA.

THE joys of dark-room operations at a temperature of 90 deg.-100 deg. F. under expeditionary methods, where everything in the way of facilities is reduced to a minimum, and both quarters and apparatus have to be improvised, would require the lurid pen of an Edgar Allen Poe to describe. A word of warning to cinematograph and photographic operators attached to expeditions fitting out for the tropics—*carry a reliable small portable dark-room* suitable for changing plates and films and to do a few developing tests in—it is an absolute necessity. Even on the darkest of nights in the forests the darkness is broken every few seconds by vivid blue flashes of tropical lightning, and there is no native hut that is light-tight or rainproof; in fact, the interior of a native hut in the "bush" is a ghastly nightmare to be shut in for an hour. Firstly, it has to be stuffed up in about one hundred or more different places to make it light-tight and to help suffocate the occupant. The next thing, in the absence of a table, is to clear the centre of the floor and squat on it. By the time one is ready to start loading, say, about 1,200 ft. of cinematograph film and unloading the same amount of exposed film, then doing the same with a dozen or two plate carriers, the temperature has risen considerably, and the perspiration is actually dripping off one's fingers over the emulsion. The writer adopted native customs in the way of attire, *but* discoverod that he was not the only occupant of the hut; it was also the home of scorpions, a tarantula spider had been killed in it during the afternoon, beetles buzzed around, *real beetles, weighing over half a pound in weight*. One huge specimen of horned beetle buzzed in with a bang, and smashed the lamp-glass to atoms. Another of the same species collided with one of the expedition in the darkness, and gave him a lovely black eye. It is a very pleasant sensation to be loading film and hear the unmistakable rustle amongst the reeds of floor of some creepy crawly thing, then, whack! a lizard falls out of the roof on to your bare shoulders. The writer had not a portable dark-room, and next time he photographs in West Africa that will be one of the first items on the list.

Coming to the question of exposure, owing to the idea prevalent that the sun being vertical and the light glaring, it is easy to over-expose, and therefore necessary to stop down, one under-exposes, and gets soot and whitewash results. The writer has found that the old adage quoted by him before in his "Night Photography" and other photographic publications holds good in the tropics, viz., "expose for the shadows and let the high-lights take care of themselves." There is, in the first place, a distinct yellow haze occasioned by the intense heat and the humidity. In the second place, a lot of the light is green, reflected from the dense masses of tropical vegetation; other factors to be taken into account also are the colour values of the natives and the soil; the native being a dead black, and the soil highly ferruginous and ranging in colour from yellow through the reds to burnt umber.

The best time to photograph is either the early morning or late afternoon, but one can photograph all day long with care and the protection of an umbrella for the camera. The writer's cinematograph camera got so hot at times it was unbearable to the touch.

Development in the tropics is certainly not advisable, and except for a few tests or an odd plate or two, all exposed film and plates should be packed up tightly in specially fitted tins with calcium chloride and mailed back to England for development. It is a good plan to have oilskin envelopes, into which may be packed film "take-ups" in use, *i.e.*, if a roll of cinematograph film is not finished at the end of the day's work, remove it from the camera and roll up tightly in an oilskin bag. Dark-slides and plate carriers should be treated in the same way.

In development the great difficulty lies in temperature. It is almost an impossibility to keep the temperature down. The image flashes up very quickly, and a good negative may be developed fully out, with normal exposure and diluted developer, in one-half to one-third the usual time.

Fixation is the height of vexation, for it is in the fixing bath that the already softened emulsion meets its Waterloo. After two or three minutes in the fixing bath, even though the emulsion may have been hardened, one may safely look for it under the plate or hiding in the corner of the dish, not unlike a sticky ju-jube. Of course, under proper conditions, where ice is obtainable, one may get fair results—but not lasting—as it is impossible to wash thoroughly and completely eliminate the hypo.

Drying is another difficulty. Apart from the heat and the possibility of melting, ants and various insects make "small-chop," or, in other words, dine off the emulsion, and thrive on it.

The wonders of the primeval forests of Africa are, to a scientist and a photographer, stupendous. One can be observing, studying, collecting and photographing from early morn till nightfall, and after night comes on the great silence is broken by the shrill whistle of countless millions of insects, the babel of sound being not unlike the shriek of a locomotive

whistle entering a tunnel. The darkness is intense even on a moonlight night, for some parts of the bush are so dense that even at mid-day one can hardly see. The only light that breaks the inky blackness is intermittent flashes of lightning and the flicker, flicker, of countless fire-flies. Their tiny little blue light is like a miniature electric arc-lamp, flitting from one side to the other in sinuous waves, suddenly going out as the fly comes to rest on a leaf, then flitting on again. Above these weird noises may be heard the loud agonising wail of the little tree-bear. The wee animal is not larger than a cat, yet it makes a loud, plaintive and most dismal call, louder than many of the larger animals of the forest. Moving through the tangle of rope-like creepers hanging hundreds of feet from the branches of the giant mahogany, cottonwood, teak, and other trees towering skywards, one disturbs many queer denizens of the forest, from monkeys to chimpanzees, and clock-birds to parrots, and chameleons to enormous snakes. As the natives chop the road yard by yard one is kept busy the whole time collecting, studying and photographing.

The difficulties of transport are enormous, and one must leave everything to the native carriers, who carry cameras, instruments, kit, tripods, etc., on their heads as head-loads. It is really marvellous how these native carriers are so sure-footed and careful. The writer wanted to film some waterfalls in the Central Territories of the Gold Coast near the Volta River, and to do so it required all his energies to chop and climb over rock ledges hanging thick with creepers, over huge fallen cotton-trees nearly 30 ft. in diameter at the roots, wading up rapids and crossing the ravines on fallen trees that one had to negotiate on all-fours, yet the native carriers did it, head-loads or no head-loads, and the apparatus, a heavy cinematograph camera, tripod, case of reloads, and an ordinary camera, was transported in perfect condition.

The writer would strongly recommend as a most useful auxiliary camera on tropical expeditions, where all the apparatus has to be transported by means of head-loads, a small camera such as the Baby Sibyl, and a supply of a dozen or two dozen loaded sheaths; also the new small Debrie cinematograph camera. These two cameras could be easily carried in a small knapsack, or even in one's tunic pockets. The writer needed a small portable camera very much, as he missed many wonderful shots whilst climbing through forest glades, where it was impossible for him to handle a heavier camera.

ROBERT DYKES, F.R.P.S.

FLASHLIGHT PHOTOGRAPHY OF NATURAL HISTORY SUBJECTS.

(A Paper read before the Royal Photographic Society, and published in the Society's Journal.)

LITTLE is known of the habits of many species during the hours of darkness, though it is assumed that when not attending to domestic duties birds as a whole merely roost and sleep. On the other hand, even when attending to such duties, some species may still sleep by night, whereas others may continue their activities throughout the day and night, and others, again, only attend to their young ones by night. We may, therefore, set ourselves to investigate and illustrate the life of birds by night, of which, practically speaking, little is known. The Great Crested Grebe, for example, we know, take turn and turn about at incubation during the day, and each parent bird turns the eggs once an hour, but precisely what happens during the hours of darkness we are uncertain of, and have no photographic records by flashlight similar to those daylight studies that have been obtained. Owls are known as nocturnal species, and though there are many beautiful photographs available of their domestic habits by day, there are no records of their behaviour by night. The Manx Shearwater is a bird (not now found in Manxland) which nests in holes in the ground, like puffins. It is rarely seen on land, as most of its life is spent out at sea, only returning to relieve its sitting mate by night. I am told that on one island in the Scillies the scene at night is like a resurrection, so that flashlight records should not be a difficult matter. As another example we may consider the nightjar, which rests like a log all day, but becomes active at nightfall and feeds its young at intervals throughout the night. Precisely how, no one knows, but flashlight may yet provide a solution of the problem.

Insect and Other Forms of Life.

The study of insect life is one that causes a thinking man to pause. It is appalling in its sheer immensity, for the field is apparently illimitable. Sufficient it may be for naturalists in this country to confine their attentions to British species, any one of which will provide ample food for reflection and study in their leisure hours for years. Their name is legion, for spiders, included for 'convenience' sake within the category, comprise no less than 500 different species on the British list, beetles, 3,000, as against 300,000 in the whole world, butterflies and moths more than 2,000, and the number of Hymenoptera, or flies, including gnats, mosquitoes and the like, must run into many thousands.

That photography was an epoch-marking discovery most people now recognise, but outside scientific circles comparatively few really understand the extent to which it has operated in unravelling the tangled skeins comprising the life-histories of creatures connected with their health and welfare.

Flashlight photography is, of course, no new thing, neither is its application to the portrayal of natural history subjects, for Richard Kearton it was, I believe, who first published records of birds and insects obtained in this way when he lived at Elstree in Hertfordshire. For my part the idea did not occur to me until some years later when taking up the photography of wild life as a serious occupation, and it was not until the year 1918 that I undertook research work in that direction.

Early Experiments in Flashlight Photography.

The only data I had to work upon in my early experiments was that kindly given to me by a mining engineer who had taken successful photographs at close quarters in subterranean works, and he informed me that it was necessary to use a fairly short focus lens with a wide aperture. On the conclusion of the Armistice in 1918, and when such work was permissible in the spring of 1919, I ventured to experiment in my garden, and having found a butterfly by the aid of a lamp, resting on some vegetation, I made an exposure by the use of a heavy charge of powder. The result was full of promise, which was confirmed by additional records made of similar subjects, and plans were made for further experiments, because I could see no reason why such an open stop as the one I had used (*i.e.* *f* 4) was really necessary, and moreover a greater depth of focus was imperative if more valuable records were to be obtained. Many plates were exposed from that time onwards with gradually decreasing aperture, until

successful results were obtained of insects on life-size scale and with the lens working at *f*/45.

Having thus established to my own satisfaction one of two important facts, further experiments were conducted with increasing confidence, with a view to ascertaining the quantity of powder necessary, and the amount was gradually decreased until I found that 60 grains was adequate, for life-size pictures with the 6-in. lens working at *f*/32, and using a Wellington Anti-Screen plate.

Throughout these early experiments I was somewhat troubled by scattered high lights in the resulting negatives, and other hard contrasts which caused me to consider ways and means for overcoming the objection. I attribute the absence of hard contrasts, referred to by Dr. Rodman in his kindly reference to my work at the recent Exhibition, to the use of a light-filter which I adopted in all my later work, and to slow development. It was, and is still, my invariable practice to use a K 1 screen for ordinary subjects on anti-screen plates, and either a K 2 or K 3 for Ilford Panchromatic Special Rapid, and I must confess to finding my negatives much less contrasty than formerly.

It was from the middle of the summer season to the early days of autumn in the year 1919 that I contracted the habit of staying out at night, under the pretext of flashlight photography. During that year, and also in 1920, it was my custom to search my garden, which was sufficiently extensive to provide a nightly supply of suitable subjects, by the aid of an acetylene head-lamp from a motor-cycle, and many very interesting insects were revealed, including those which hide themselves by day. Spiders, such as the Diadem spider, the largest British species and common in gardens, are very good sitters. An interesting discovery was made on one occasion when I was taking a flashlight photograph of a spider. The web was a particularly striking one, and, being desirous of securing the best result possible on such a favourable night, preparations were made with extra care. The lens, an *f*/5.9 Zeiss, was not more than 12 to 15 ins. from the spider when the flash was fired from a metal tray placed on the camera bellows immediately above and behind the lens. Closing the slide, the light was turned on to see if all was well prior to exposing another plate, but not a sign of spider or web remained. The duration of the flash must have been so brief as to allow of the photograph being taken before the air disturbance had travelled the intervening distance of 12 to 15 ins. My disappointment may be understood, likewise my surprise when the plate was developed, which was done as a matter of curiosity later on.

One's lamp frequently discloses larvæ of moths and butterflies, feeding and resting, also moths themselves, which ordinarily are exceedingly active at such an hour. Every opportunity should be taken of figuring these finds, as some, such as the Golden Plusia, may prove to be a stranger to the locality. In this particular case the insect had not been seen in my locality previously, and was thus recorded as extending its range northwards. The Brown Spot Pinion, a noctuid species, and very common, invariably hides itself away by day, yet flashlight enabled me to figure this specimen on the hole of an elm. It was of such a placid disposition that I was able to take a stereoscopic record by two distinct flashes, and with a single lens mounted on a sliding panel.

A connecting link between my earliest experiments and those later ones which suggested the possibility of figuring slightly moving objects, was formed when my friend, Mr. A. E. Tonge, F.E.S., discovered the Scalloped Hazel larva at rest on the delicate foliage of everlasting pea, one cold and windy night in October, 1920, when it was photographed as a demonstration of flashlight photography on such subjects. The fact that the foliage was continually in a state of disturbance had not affected the result in any way. This result led me to think that it might be possible to ignore slight movement due to wind, and that if such an assumption be true, one would also be able to ignore slight movement on the part of the subject, within reasonable limits. In this way I came to consider the possibility of snapshots by night through a lens working at *f*/32, and of which I hope to say more later.

It will readily be understood, I know, that one can only touch upon the fringe of the field of work upon creatures in the wild, but prior to passing on to other applications of flashlight photography one should indicate other attractive work for one's camera. The night photographer may adopt a ruse frequently practised by bird-men to attract species to the vicinity of the camera, *i.e.*, by setting a lure, in the nature of a mixture of molasses and rum flavoured with essence of pear or aniseed, on tree trunks, fences, and gateposts. By this means many interesting records may be made of moths, earwigs, woodlice, and centipedes, and perchance a fat old toad in wait at the foot of the tree, for intoxicated revellers to fall. Similarly, it should be possible to attract ants, and burying beetles, to carcasses, and to figure them at work in the free state.

Nature Study by Flashlight Indoors.

We may now pass to a consideration of the possibilities for work upon captive subjects under cover, and thus enter upon a field which is practically immeasurable. We can but subdivide it into sections, any one of which the specialist may select for his life's work, be it lepidoptera, coleoptera, hymenoptera, and so on. The serious student, one imagines, will address himself to a systematic specialised study of one of these subjects only, without complicating matters in other directions. He may decide to investigate the life-histories of British dragon-flies, or spiders, or pond life as a whole, and set himself to study mosquitoes and the like in aquaria at home, but in any case he will certainly have ample material for study and photographic representation. It will not be denied, I think, that the maximum utility to be derived from the application of flashlight photography in the realm of natural history is not to be measured by the number of species merely figured, but by the otherwise unobtainable records of incidents connected with, or inseparable from, the life-history of the creature under observation. It is not what we set out to do, but what we achieve, that counts most of all, and the application of flashlight photography may yet help us to learn something of insect life, and perhaps lead us to new discoveries.

Beyond proving beyond dispute the feasibility of making photographic records of insect life by flashlight on life-size scale, and through a 6-in. lens fitted with a screen, and stopped down to *f*/32 or *f*/45, I had not, up to the summer of last year, carried my investigation very much farther, but in the early summer I continued my experiments indoors upon captive subjects, and having brought a number of larvæ of the Painted Lady butterfly to my home in Cheshire from the Isle of Man, I conceived the idea of making a regular series of photographic records illustrating pupation. In order to do this I arranged a number of thistle-heads in separate bottles of water, and allowed one larva only to each plant, in order that when the moment for pupation arrived my work would not be hampered by the presence of other active larvæ of an inquiring disposition. Happily, one of these insects decided to make preparation for the change before its fellows; and I made a figure of it whilst engaged upon its final feed, as it had become very fat and listless, and inclined to wander from its food plant. I then placed it on a new piece of thistle, and the next day it was found suspended. Twenty-four hours later another negative was made showing the pupa being formed inside the skin, and the head of the larva assuming a hooked shape. It was my intention to take figures every twenty-four hours until the change was effected, and fortunately, when preparing to expose another plate the next day, the larva suddenly became active, and commenced to twist itself about.

so much so that I hesitated to fire the flash. I then noticed that the skin had split behind the head, and that the pupa was emerging so rapidly that little time was lost in making the exposure. As quickly as possible another charge was placed in position and fired, but the skin had been cast in the few minutes that had elapsed, and the elongated pupa hung revealed. It was of a pale grey-green tint, and very shiny in appearance, but it slowly contracted and hardened, changing colour to a dull reddish brown with greyish stripes until, several days after, it had assumed its final form, resplendent with metallic points of shining gold.

In this way many pupal changes may be figured—practically all the metamorphoses of British butterflies, in fact—and I should imagine there would be much difficulty in making such figures in any other way, on account of the continual restlessness of the subject.

It was my intention to follow this series through to the actual emergence of the perfect insect ten to fourteen days later, and had it not been for a pressing business engagement that brought me to London on the tenth day, I feel I would have been able to show the birth of her ladyship. I have regretted ever since that I was unable to complete this interesting sequence, but I hope to make a fresh start *de novo* this season.

Another subject of vast importance which may be studied in this way indoors is that embracing the life-history of aphides. The economy of these interesting so-called pests may be examined indoors, regardless of disagreeable climatic conditions out of doors, and photographs taken at the precise moment when it is desired a record shall be made. Aphides are very restless creatures, at one moment they are nearly all quiet and subdued, and the next they all seem to turn as if obeying some parental instruction. By means of flashlight a satisfactory record may be made without showing any sign of movement.

My own knowledge of these creatures is but slight, but I understand the well-known Hover fly feeds upon the green aphis found upon rose trees, and pupates *in situ*. Finally, the fly emerges from this pupa and, to the best of my knowledge and belief, occupies its time hovering over flowers in the noonday sun, extracting honey and laying eggs.

Colour Photographs.

I should like to say a word in passing relative to colour photography by flashlight. Experiments have been made by the Paget process, but the high cost of Autochromes being beyond my slender means, and receiving no facilities from the agents, I have been unable to do more than indulge in a single exposure on an old plate. The slides I propose to show now are by the Paget process, and will, I feel sure, be regarded as evidence of the practicability of producing pictures in natural colours in precisely the same way as those just shown in monochrome. A great advantage in figuring specimens in this way is that the process becomes a purely mechanical one; no calculation of exposure is necessary, and figures can be made as quickly as the specimens can be pinned upon the board and the charges of powder weighed and laid in position.

In regard to data relative to these slides, I may say the taking scale was unity with a 6-in. lens, stopped down to *f* 10. Plate, Ilford Special Rapid Panchromatic, Paget Special Flashlight Screen placed between the lens components, and taking screen in the dark-slide. Charge of Johnson's professional flashpowder, 20 grains. As Messrs. Lumière supply a special flashlight screen also, there would seem to be no reason why photographs cannot be produced in Autochrome by flashlight as readily as by the Paget process. In both cases restless subjects can be dealt with, whereas this would be much more difficult by day, in fact almost impossible if the lens was stopped down to *f*/32.

Working Details.

As already indicated, it is now my practice to use a light-filter on all occasions, whether working with anti-screen plates or panchromatic plates, a procedure which, of course, necessitates an increase in exposure over the normal. For most subjects, maybe, a non-panchromatic plate may suffice, and in those cases the Wellington anti-screen, with a K 1 screen, will require a charge of flashpowder equal to about 50 grains, with a 6-in. lens at *f* 23, and scale life-size, or 60 grains at *f* 32. These figures are approximate, and not intended to be absolute. Moreover, the character of the subject must be considered in all its aspects, as a subject such as the pupation series just shown will probably require a larger charge of powder than a spider resting on a white-washed wall, or a white butterfly at rest, and conversely a smaller charge than a dull coloured object resting on the ground will require.

When working on restless subjects, such as feeding larvæ, or larvæ changing to pupæ, a very fast plate would seem to be most desirable, in fact high-speed plus panchromaticism would seem to meet the requirements of the night photographers admirably, on account of the necessity for using the smallest charge of powder compatible with efficiency in result. It would appear to me that the larger the charge, the greater the duration of the flash; but I speak subject to correction, and the smaller the charge the more brief it is. I must, however, confess to not having measured the speeds, nor have I been able to obtain any figures from manufacturers. Another important matter, and not the least, is that the powder employed on work of this character should be exceedingly dry, and finely ground, in order to ensure an instantaneous flash; so very imperative, as a slightly delayed flash would probably affect the result somewhat detrimentally. A procedure productive of good results on restless subjects indoors is to use a high-speed panchromatic plate, refrain from closing the lens aperture more than is necessary for depth of focus, and use a small quantity of fine dry flashpowder, such as Johnson's, redried immediately before use.

The Firing of the Charge.

The method most frequently adopted is to fire the powder by means of a piece of touch-paper set vertically in the charge, but this is open to many very serious objections, notably the uncertainty as to the precise instant of exposure. When using touch-paper one has to light it either by means of a match or taper, or some glowing object such as a red-hot poker, or the lighted end of a cigarette. In the interval between lighting and firing of touch-paper the subject may have assumed a pose quite uninteresting and otherwise unsatisfactory, so that in order to overcome this I must confess to having fired my powder direct from a hot cigarette fixed on a skewer. Latterly, however, I have become convinced of the necessity for firing electrically, and intend to adopt this method in future, arranging the mechanism in such a way as to uncap the lens slightly in advance of the firing and to close immediately afterwards. No matter whether working indoors or out in the open, some such contrivance is quite necessary, but in either event, dry powder is imperative. In the former case such conditions are easily obtainable, but when out in the open it is another matter, especially in winter time. True, the operator is able in most cases to lay the charge a few seconds prior to firing from a dried supply, but frequently this is impracticable, for example, when awaiting the gentle noiseless descent of the nightjar to feed its young, the emergence of a fox or badger from its earth, or the appearance of the shearwater at the entrance to its hole. No warning is given, the eagerly awaited and "demd elusive object" of the photographer's patient vigil appears silent and unexpectedly; he must therefore be prepared. How best then can the climatic vagaries of this country be countered? I can only offer a suggestion in the absence of much experience, namely, the possibility of keeping the powder in some form of closed and gently

heated receptacle, the top of which can be thrown back, like a cycle head lamp, at the time of firing, electrically. As one who has spent many nights alone in the wild, on mountain tops, in forest trees, and on the rock-strewn coast, I can speak from experience of the conditions, and having prepared and fired flash-light there, I can anticipate difficulties, and warn would-be experimenters of the deliquescence of flashpowder.

General Observations.

One cannot do more than indicate very briefly a few of the many directions in which flashlight photography can be applied in the study of natural history subjects in the short time available on such an occasion as this.

Reference should, however, be made to the practicability of photographing insects and minute forms of life on a scale greater than life-size by instantaneous exposures. This has already been proved. Experiments in colour photography also lead one to feel sanguine of ultimate success in taking photographs of moving insects in their natural colours, and on a scale several diameters above life-size.

The field naturalist is nothing if not optimistic and, like the fly-catcher, ever hopeful that something good will turn up. For my part I feel that we are but at the beginning of things, and that the application of photography by artificial light to the study of natural history will in course of time show startling developments. We hear of moving pictures being taken by night by the aid of "potted sunlight," and maybe in the not far distant future, perchance more immediate than we anticipate, the nature photographer may be able to show moving pictures of minute forms of insect and other life in all its forms and phases and in natural colours. Flashlight is but a light of exceptional brilliance and actinic power, and some means may yet be found for a prolonged concentration of light of equal intensity to that of magnesium. A modification of the existing type of cinematograph camera should then enable the natural history student to illustrate the whole life-history of many creatures which at the present time are unrecorded.

Such a hope should be our ultimate aim, but we may yet have to traverse a road beset with difficulties, and strewn with disappointments, before we see the realisation of our desires in this respect. At the same time, there is every reason to be sanguine and to feel that we are on the threshold of further developments of an interesting character.

OSWALD J. WILKINSON.

EASTMAN KODAK COMPANY.

THE report of the directors of the Eastman Kodak Co., of New Jersey, which includes the various subsidiary Kodak companies, for the year ended December 31, 1921, discloses a surplus of $5,782,704 (£1,192,310) after charging liberal amounts for depreciation, making allowance for shrinkage in value of inventories, and paying 6 per cent. on the preferred stock and 40 per cent. on the common stock. The net profits for the period are returned at $14,105,861 (£2,908,424), a reduction of nearly £920,000, as compared with the previous year. The latter, it may perhaps be remembered, was the most successful in the history of the company. The report, however, discloses a strong financial position. A total undivided surplus of £11,983,926 goes with an issued capital of £5,394,990.

Two new names appear in the list of directors, those of George W. Todd and George H. Clark.

The following table shows the net profits since the year 1904 :—

Year.	£	Year	£
1904	688,484	1913	2,920,090
1905	827,610	1914	2,332,579
1906	1,116,639	1915	3,245,600
1907	1,446,479	1916	3,564,784
1908	1,540,725	1917	2,998,467
1909	1,619,087	1918	2,897,313
1910	1,850,552	1919	3,778,595
1911	2,401,910	1920	3,828,084
1912	2,886,401	1921	2,908,424

At a meeting of the shareholders of the Eastman Kodak Company held in Jersey City, U.S.A., on April 4, 1922, a proposal to exchange each of the present common shares of $100 for ten (10) shares of no nominal or par value was carried.

New certificates representing shares of no nominal or par value are being prepared. Ten of these shares will be issued to the shareholders in place of each $100 common share now held.

Registered shareholders have been notified that they should at once send their common stock certificates by registered post to the Lincoln-Alliance Bank, Rochester, New York, so that the exchange of certificates may be effected.

Shareholders who have lent their common stock to the British Government will, it is presumed, receive their new certificates from the Treasury on compliance with the regulations recently issued in respect of the return by the Government of the borrowed shares.

Dividends on the common shares will no longer be declared on a percentage basis, but will be at so much per share. Thus the dividend just declared as payable on July 1, 1922, is at the rate of $1.25 (one dollar twenty-five cents) per new share of common stock of no par value.

ELECTRIC CURRENT AT POWER RATE.

THE important case dealing with the use of electric power by photographers was decided by Mr. Justice Rigley Swift in the King's Bench Division on Monday last, May 22, in the claim brought by the Westminster Electric Supply Corporation, Ltd., against the Wykeham Studios, Ltd., of Victoria Street, Westminster.

Plaintiffs sought to recover £82, representing a sum alleged to be due for electricity supplied to the defendants.

Mr. Justice Rigley Swift, in giving judgment for the plaintiffs, said:—In this case the plaintiffs claim the sum of £82 18s. 5d., being the cost they allege to be payable by the defendants for electricity supplied to them at 165, Victoria Street, together with meter rental. On an application for judgment under Order XIV. the defendant company admitted that they were liable to the plaintiffs for the sum of £48 5s. 10d. Liberty was given to the latter to sign judgment of the Court and liberty was given to defendants to defend as to the balance of the claim, £34 12s. 7d.

It was admitted in the course of the action before me that the amount claimed was arithmetically accurate if the plaintiffs were entitled in law to charge the rate they had done, but the defendants contended that in law the plaintiffs were not entitled to charge them at the rate of 7d. or 4d. per unit in the midsummer, Michaelmas, and Christmas quarters for certain electricity supplied, and it was contended by them that they should be charged at the rate of 2d. per unit.

The plaintiffs are a company registered under the Companies Act, 1862-1866, carrying on business under the provision of the Westminster Electric Lighting Order, 1889 (confirmed by the Electric Lighting Orders confirming No. 2 Act, 1889), and they supplied electricity in the area mentioned in the first schedule of the Order and in the area the defendants carry on business as photographers. The plaintiff company has for many years past been in the habit of supplying electricity at two different rates of charge, one rate of charge being applicable to electricity used for lighting purposes and another and a lesser rate being applicable to electricity used solely for purposes other than lighting, and supplied through a separate meter and known as power rate.

The defendants for some years had been in the habit of using electricity for the purpose of a photographic arc lamp used by them for the purpose of providing an exceptional light for the taking of photographs, and it was admitted that the electricity, the price of which this action is now considering, had been used by the defendants for purposes other than general illuminating purposes. In the account which was the subject matter of this action the plaintiffs sought to charge the defendants at a higher rate than the maximum rate stated by them to be payable for electricity used for power purposes, and the defendants object that this current having been taken and used by them for power purposes, that is to say, for purposes other than lighting and through a separate meter, they were not liable to be charged more than the maximum rate for power purposes.

I find as a fact on the admissions made before me that the electric current used by the defendants for the price of which plaintiffs claim in this action was used by the defendants for power purposes and not for lighting, and that it should be charged for at power rate and not at the lighting rate. This, however, does not dispose of the action, for the plaintiffs contend that even if they were under

circumstances compelled to treat the defendants as taking electricity for power purposes only they might still charge them at the rates which they had done in the action, that is to say, 7d. per unit for the quarters ending midsummer and Michaelmas and 4d. for the quarter ending at Christmas, 1921. The right of the plaintiffs to so charge is dependent upon the construction of sections 18 and 20 of the Electric Lighting Act, 1882. By section 19 it is provided that where a supply of electricity is provided in any part of an area for private purposes, then, except in so far as is otherwise provided by the terms of the licence, Order or special Act authorising such supply, every company or person within that part of the area shall, on application, be entitled to a supply on the same terms on which every other company or person in such part of the area is entitled under similar circumstances to a corresponding supply. Section 20 provides that :—" No undertaking shall, in making any agreements for a supply of electricity, show any undue preference to any local authority, company or person, but, save as aforesaid, they may make such charges for the supply of electricity as may be agreed upon, not exceeding the limits of price imposed by or in pursuance of the licence, Order or special Act authorising them to supply electricity.' The meaning of these two sections has been discussed in four cases to which my attention has been drawn. In the Metropolitan Electric Supply Co., Ltd., v. Ginder, 1901, 2 ch. 799 Buckley, J., held that in making agreements the undertaker would have regard to special circumstances, *e.g.*, the amount of energy consumed, the expense of supplying it and getting payment, the uniformity of demand, and the fact that some consumers required energy by day and some by night, and that unless all the circumstances were similar, agreement might be made for different terms and at different rates. In the Attorney-General for Victoria and the Mayor, Aldermen, Councillors and Citizens of Melbourne, 1907, A.C. 469, where under the Victorian Electric Light and Power Act, 1896 (of which sections 38 and 39 were in practically the same terms, as sections 19 and 20 of the Act, 1882), the respondents supplied electricity under two different systems and charges—one at a fixed rate and the other at a rate varying in the unit consumed and the consumer could adopt either system at his choice, and within each system no preference was given to one customer or another, it was held that the suppliers were authorised so to charge and were not restricted to one uniform rate for all electricity supplied by them, and it was held by the Privy Council that the preference prohibited is a preference between customers dealing under similar circumstances and not between customers dealing with two different systems of supply, either of which they are free to select and therefore dealing under entirely different circumstances. In the case of the Attorney-General v. Long Eaton Urban Council, 1914, 2 ch., page 251, Mr Justice Sargant said at page 263 :—I think a fairly clear distinction may be drawn for the present purpose between those reasons for making a lower or preferential charge which under legislation of this kind are legitimate and those which are illegitimate. It would seem that A must not be charged less than B merely to overcome a greater reluctance on the part of A to become a customer in respect of another supply, although either of these reasons might be a good commercial reason for charging less to A were the public undertaker merely carrying on any ordinary commercial business. On the other hand, any circumstances which render it less costly or otherwise more profitable to supply A than B constitute a legitimate reason for making a lower charge to A for the same supply. And if the Court once came to the conclusion that some such circumstances existed, then proof would not be required that the diminution in the charge was precisely equivalent to the diminution in the cost of the supply. In that case the learned judge was dealing with a case in which the undertakers had issued a circular with reference to the price charged for electricity to power consumers, the effect of which was in certain cases to make a lower charge for power purposes to consumer A by whom electricity for the supply of both power and lighting was taken, and a higher charge to consumer B by whom electricity or supply of power or power and partial lighting was taken, and the effect of his judgment is that the differentiation was a breach of the sections, both 19 and 20. By Section 19 of the Acts the supply of electricity to consumer B for power purposes was a supply corresponding with a supply to consumer A for power purposes, and was applied for and given under similar circumstances, and by Section 20 of the Acts the lower charge to A was an undue preference. In the case of the Attorney-General v. Hackney Borough Council (33, "Times" Law Reports, p. 548) Mr. Justice Astbury held that a differentiation fairly arrived at between classes of customers or between customers in any one class *inter se* might be made by the undertakers provided that no differentiation was made between customers taking or entitled to take supplies which corresponded in similar circumstances, and that there was no undue preference given to power users over light users because the circumstances affecting the supply were substantially different in the two cases, and justified in the interest of the undertaking the difference in treatment. On page 549, he said :—These sections say nothing about and do not draw any distinction between light, heat or power users as such. The station turns out only one class of energy, which is measured in Board of Trade units, and the dissimilarity of circumstances and the non-correspondence of supply involved in Section 19 must be looked for not in any difference in the energy consumed or in the manner in which it is led into and distributed by wiring and meterage in the customer's premises, but in the circumstances of the customer himself in so far as they react upon the supply that he takes, and in the time, diversity, and quantity of his consumption. In other words, the purpose to which the consumer puts the energy which he purchases, whether for lighting, power or heating, is *per se* irrelevant : it is in the quantum of, and in the circumstances under which he takes his supply of the one product that the undertaking offers for sale that the answer to the question as to undue preference must be looked for, and it is only for the purpose of classifying customers according to this test that they are for convenience divided into light power and heat classes, such purposes involving, as I have already pointed out—well recognised differences from the point of view of load factor, diversity factor, and the quantity of units purchased. Customers may therefore be and are in practice divided into classes in accordance with these considerations, and they are charged with varying and different rates and classes of rates with the object of encouraging advantageous purchasers and classes of purchasers, as well as of attempting to adjust fairly the respective charges obtained from the station by all. This had led to what is termed different systems of supply being adopted as a fact, for instance, for lighting, heat, power, etc., the customer in each case taking the only thing that the undertakers have to sell, but in circumstances which affect differently the load factor of the station in both diversity and quantity. If the different systems of supply are fairly arrived at, and are at the choice of the customer, the preference prohibited by section 20 is between customers dealing in similar circumstances and not between customers dealing under different systems for supplying (see Attorney-General for Victoria v. Melbourne,, Corporation 23, The Times L.R., p. 753; (1907) A.C., 469) to the extent that the customers under one system benefit the undertaking in the way I have described to a greater degree than customers under agreement, they are given a benefit in the scale of charges. This is expressed by Mr Justice Sargent in the case of the Attorney-General v. Long Eaton Urban Council (30, "The Times," L.R., 537 (1914), 2 Ch., 251), in these words :—" Any circumstances which render it less costly, or otherwise more profitable to supply A. than B. constitute a legitimate reason for making a lower charge to A. for the same supply. Now is the right to differentiate the scale of charges confined to different classes of customers or to different systems. There is not a attitude to the company to make bargains with its individual customers when circumstances differ or the supply does not correspond for different terms." Then what does corresponding supply mean. Does it mean that you are necessarily to treat the small customer upon equally advantageous terms as the large customers. Due cost to the company may be very different. Greater uniformity of demand, easier and less expensive collection of the amount to be paid are circumstances to which regard must be had. (See Mr Justice Sankey in Metropolitan Electric Supply Co v Ginder, 17 "The Times," L.R., 435 (1901), 2 Ch. at p. 811.) Therefore, any differentiation fairly arrived at between classes of customers or between customers in any one class *inter se* may be made by the undertakers provided differentiation is not made between customers taking or entitled to supplies which correspond in similar circumstances which is the only thing that is prohibited by section 19. I think the result of these decisions is that where current is supplied on two different systems, the choice of which is left to the consumers, there is no infringement of section 19 and 20, and that as between customers of each system, the undertakers are entitled to differentiate as to price, provided that the special circumstances of such customer are had regard to. But it was con-

tended by Mr. Blanco White that in this case the defendants using the current for power purposes had been charged more than the rate which was fixed and advertised by the plaintiffs as being the rate for current supplied for power. I do not see why this should not be done, if regard is had to the special circumstances of those who are charged at the higher rate, and if a proper differentiation can be made between them and others, who are being supplied with current for power purposes in the same area. Provided that the undertakers do not charge more than the amount which is fixed by the Act, or which for the time being is agreed upon between them and the consumer, I cannot see why they should not be allowed to charge a consumer more if the circumstances under which he is taking power are not similar to those of other persons who are taking it. Now, in this particular case, the photographers, speaking generally, are not taking current for power purposes under similar circumstances to other manufacturers. Their lamp is not burning regularly and for fixed hours during the day or night, but is intermittently used as occasion necessitates for the taking of particular photographs, and I think that the undertakers are entitled to say that, although their ordinary charge to persons using current for power purposes is 2d. per unit, they would charge a higher rate to persons who take current for use in a photographic arc lamp. I, at any rate, see nothing in the sections to which I have referred, as they have been construed by the Courts in the cases I have mentioned, which is inconsistent with this view. It is clear that here the plaintiffs were under no agreement to charge the defendants other than the rate which they did, and the defendants had ample notice of the rates which they would be charged if they took a current. All photographers in the area using this supply have been treated in the same way, and I see no reason for holding, that the defendants taking this current with notice that they would be charged for it at the rate which they had been, should be relieved from payment of those rates. Under the circumstances there will be judgment for the plaintiffs for the amount claimed, with costs.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

Dissolving Amidol.

To open a bottle of amidol, weigh out so many grains, and dissolve it in any room where plates, papers, negatives or prints, are kept or handled, means risking the appearance of a beautiful crop of maroon-coloured spots at an early date. In fact, the keeping of an opened amidol bottle or a pair of scales in such a room may cause a regular occurrence of this trouble. After suffering at various periods, I hit upon the following dodge to avoid it. The water is heated in a large enamel baler, and the sulphite and preservative dissolved completely before touching any amidol. Then a full oz. bottle is submerged in the sulphite solution, and with the clean, small blade of a penknife, the cork is removed under water. By moving the bottle about in the solution, all the amidol will be taken up without any possibility of the salt getting into the air, The formula which lends itself to this treatment is as follows :—

Water (hot) about ...	...	40 oz.
Glycollic acid ...	...	10 grs.
Soda sulphite ...	...	10 oz.
Amidol	...	1 oz. (new bottle each time)

Pour into a Winchester bottle, fill up with water, and use 1 part to 1 of water. This formula will keep. Bromide is optional, but may have to be calculated according to the papers used.

The ounce bottles may be objected to by large buyers or consumers, who are used to the lb. size, but the advantage is so great that this disadvantage is outweighed. Of course the best way of all, to make up any solution, is to do it in a special room, into which no plates, prints, or other photographic tackle ever goes, but this is not convenient everywhere. Another detail which may need mention, is the advisability of removing coloured labels, cork wax, etc., before submerging a bottle. Using Johnson's amidol, I have not found it necessary to remove anything, submerging the bottles just as they are bought, but, of course, the dodge may appear abortive if dirty benches, or opened bottles are near at hand, as traces of amidol on them may still cause trouble.—THERMIT.

Prepared for a Water Shortage.

SOME little time ago I opened the workshop on a holiday in order to get an urgent batch of work through. Just when the major portion was ready for washing, off went the water—and stayed off for the rest of the afternoon. This was discouraging, but as most photographers must know, it was not to be unexpected. The experience caused me to take measures to dodge, to some extent at least, a repetition of this form of annoyance, so I rummaged round next day for something in the way of a large water container. At first I thought of having a cistern installed, but as I did not want to bring in plumbers, etc., at a busy time, I looked for a simpler way out of the difficulty. I was fortunate in finding a small spirit cask in a pharmacist's cellar. This just fitted in a corner by the sink and could easily be filled with the aid of a hose-pipe from the tap. A wooden wine tap projecting over the sink completed the fitment. Two days after installing the cask, it proved its worth by supplying the necessary for making up a few winchesters of solutions, the water-main having temporarily gone on strike again, but since then I have realised its value to a greater extent. Those—and my experience goes to show that they are many—who are troubled with "intermittent" water supplies, know the pettifogging annoyance of placing a measure, dish, or bottle under the tap just one-half second before the water stops to flow and starts to make noises in the pipe for an indefinite period. With a container right at hand, one is independent of these little troubles, and it is worth its room for this only. The only drawback of the above arrangement was that it did not exactly improve the appearance of the room, but this was got over by one of the hands who is blessed with an artistic temperament. He decorated the end of the cask with four big X's in white chalk, and the dark-room consequently looked unusually cheerful.—THERMIT.

Exhibitions.

THE POLYGON CAMERA CLUB.

THE above club, which was formed last year, and consists of past and present students of the Regent Street Polytechnic Day School of Photography, held their first annual exhibition in the School last week, over a hundred photographs, mainly portraits, being on view. Judging from the high level of quality which prevailed, it is not surprising that most of the students make successful portraitists when they start in business on their own account, as most of them do. A noteworthy feature is that in every case the entire production, from posing the sitter to mounting, is the unaided work of the individual worker, thus proving the thorough all-round instruction given by the School.

A very practical innovation was the choosing of members of a well-known firm of photographers as judges; Messrs. Miller and Scott, of Sloane Street, officiated in this capacity. Two medals were awarded by the judges and one by a ballot of the club members.

The awards were:—Portraiture: First (with medal), Miss Daisy Day; second, Mr. A. Riddoch; third, Miss Daisy Day. Landscape: First (with medal), Mr. Howard; second, Mr. Hooper; third, Mr. Hooper. Technical: First, Mr. Hooper; second, Mr. Wilkinson; third, Mr. Obbard. It says a good deal in favour of the general quality of the work when it is noted that a fine portrait by Miss D. Galloway, which has just won the challenge cup of the Northumberland and Durham Federation, did not secure an award here.

In another room a small display of technical work by members of the teaching staff, who all belong to the club, included specimens of oil finishing, Autochromes, photomicrographs, the various stages of photogravure, and portraits by the trichrome process.

FORTHCOMING EXHIBITIONS.

April 22 to May 27.—Royal Photographic Society. Colonial prints arranged by "The Amateur Photographer and Photography." Open daily from 11 to 5 p.m. 35, Russell Square, London, W.C.1.

June 1 to 30.—Royal Photographic Society. Prints by Pirie MacDonald, of New York. Open daily from 11 to 5 p.m., 35, Russell Square, London, W.C.1.

August 26 to September 9.—Toronto Camera Club. Latest date for entries, July 22. Secretary, J. H. Mackay, Toronto Camera Club, 2, Gould Street, Toronto, Canada.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, May 8 to 13 :—

PHOTOGRAPHY.—No. 13,195 Photography. C. Dekker, E. Lewis, and P. S. Kooistra.

BROMIDE PRINTING.—No. 13,306. Means for automatically determining period of exposures in photographic bromide printing apparatus. C. B. Priestner.

PRINTING APPARATUS.—No. 13,510. Photographic contact printing apparatus. W. F. J. Smart and A. L. White.

FOCUSSING.—No. 13,181. Focussing means for photographic cameras. J. S. Stanyon.

APPARATUS.—No. 13,436. Photographic apparatus. C. Wojcik.

PROJECTION APPARATUS.—No. 13,320. Automatically-focussing projection apparatus. Kodak, Ltd.

COLOUR REPRODUCTION.—No. 13,386. Photographic reproduction in colour. A. E. Bowtree and A. R. Trist.

STEREOSCOPIC CINEMATOGRAPHY.—No. 13,005. Means for giving a stereoscopic effect to cinematograph pictures. M. Steinman-Bezencenet.

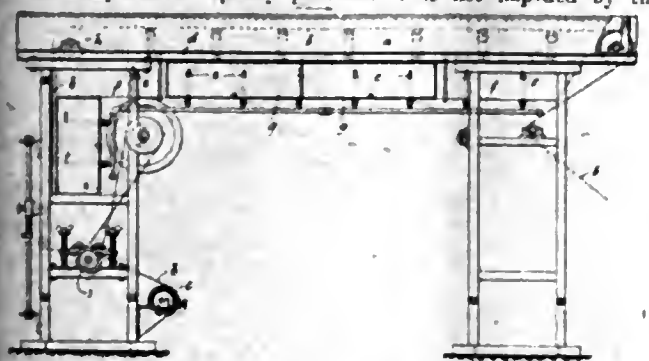
COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; if abroad, in the case of patents granted under the International Convention.

PAPER-SENSITISING MACHINES.—No. 177,073 (April 14, 1921). In the manufacture of certain kinds of photographic papers, e.g., those employed by engineers for the reproduction of drawings, it is usual to unwind the paper from a roll and after applying thereto a ferro-prussiate sensitising medium, to continue the travel of the paper through a heating chamber or zone whereby it is dried to a degree sufficient to enable it to be re-reeled or otherwise dealt with.

The coating of the paper in such instances can be effected with comparative rapidity provided it is not impeded by the



time occupied in drying. This time factor is, however, largely governed by the path available for the paper to travel.

The invention consists in arranging that the heating chamber shall extend vertically from one or other or both ends of the customary horizontal trunk so that for a given overall length of floor space a relatively longer drying path for the paper is obtainable.

In the drawing the horizontal trunk *a* through which the treated paper *b* proceeding from the roll *c* and emulsion-applying device *j* travels is of a form well known, being rectangular in cross section and supported by a pair of longitudinal irons, *d*, beneath which are arranged gas jets *e*, in a heating duct *f*, *g* being doors to enable access to be readily had to such jets. The paper *b* before it reaches the drum *h* in the trunk *a* travels upwardly adjacent to a downwardly directed extension *i* of the heating duct *f*. The heating path for the paper is thus appreciably increased for a given length of apparatus, which increase might be obtained by arranging the extension at the opposite end of trunk *f*, directed either downwardly or upwardly, according to the direction in which the paper is conducted from the machine; or the length of the path may be further augmented by employing extensions at both ends. It has already been suggested, in apparatus for drying photographic paper strips after exposure, toning and fixing, that the strips should be drawn through a horizontal tubular flue, over a guide roller, and then downwards through a vertical part of the flue, thereby gradually approaching nearer and nearer to a source of heat situated at the bottom of the vertical section of the flue.—John William Davies, 30, Rothschild Road, Chiswick, London, W.4.

The following complete specifications are open to public inspection before acceptance :—

TELEPHOTO LENSES.—No. 179,529. Spherically, chromatically and astigmatically corrected telephoto objective. Firm of C. Zeiss.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, MAY 29.

Southampton Camera Club. Print Competition. Subject—Winter and Spring Landscape.

TUESDAY, MAY 30.

R.P.S. "Wild Flowers." Edward J. Bedford.
Bournemouth C.C. Lantern Slide Making. W. L. Carter.
Hackney Phot. Soc. Annual Meeting.
Manchester Amateur P.S. "A Negative, and its Interpretation." Messrs. Bonner, Hadley, Jarrett and H. E. Johnson.

WEDNESDAY, MAY 31.

Bradford Phot. Soc. Outing to Esholt Hall and Woods.
Croydon Camera Club. Members' Print Display.
Dennistoun Amat. P.A. Outing—Kelvingrove Park.
Exeter C.C. Outing to The Red House, Whipton.
Rochdale Amateur P.S. "What is a Good Negative?"

THURSDAY, JUNE 1.

Hammersmith Hampshire House P.S. Annual General Meeting.

SATURDAY, JUNE 3.

Hammersmith Hampshire House P.S. Outing to Marlow.
South Glasgow C.C. Outing to Blanefield.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, May 23, the president, Mr. W. L. F. Wastell, in the chair.

The programme was arranged by the Scientific and Technical Group, and included the following subjects:—

A paper on "Spectroscopic measurements of the hydrogen ion concentration colour changes in recent indicators," by Messrs. T. Thorne Baker and Leslie F. Davidson, was read by Mr. Thorne Baker. It dealt with the changes in the absorption of certain colouring matters (those used as indicators) by acid and alkalies. The authors discussed the usefulness of these indicators in the testing of gelatines.

Dr. Slater Price thought that caution was necessary, in the case of gelatine in accepting colour changes as indications of differences in chemical properties. The colloid character of gelatine could not be neglected.

Mr. K. C. D. Hickman then described a piece of research on the dyeing of silver iodide with methylene blue. He had endeavoured to discover the chemical mechanism which caused silver iodide to mordant a dye and had limited himself to methylene blue B. He

first experimented with silver iodide precipitated from aqueous solution, i.e., without gelatine. Under certain conditions well-washed silver iodide did not fix the methylene blue at all; under other conditions it exhibited two distinctly different degrees of mordanting, one representing a dark-blue dyeing and the other a much lighter blue. In the course of a long series of experiments he obtained circumstantial evidence for the theory that the dyeing of the silver iodide is dependent on the formation of the complex of silver iodide and potassium iodide. Any condition which favoured occlusion of this complex within the silver iodide likewise intensified the dyeing effect. He described also some further experiments on the dyeing of silver iodide images obtained by bleaching the silver image of a plate, as in the Traube process, and referred also to the effect of the tanning action of the developer on the gelatine.

A somewhat lively discussion took place between Mr. Hickman and Dr. Slater Price. Fortunately, when matters seemed to have reached a deadlock, it was suddenly discovered that the two controversialists were in agreement.

A paper on "The function of the flash exposure in three-colour work," by Messrs. E. L. Turner and C. D. Hallam, was read by Mr. Turner. It described the results of the further series of quantitative investigations in half-tone which are being carried out at the L.C.C. School of Photo-Engraving, Bolt Court. In three-colour half-tone, a flash exposure (to a piece of white paper) was necessary for correctness of rendering. The authors had made measurements of the reflection densities of the original and the half-tone reproduction in a number of cases, and had found that the most truthful rendering was obtained by a flash exposure of about 3 per cent. of the time of the exposure employed in making the half-tone negative from the original. Some discussion followed between Mr. Olaf Bloch and Mr. A. J. Bull as to the effect of the characteristic curve of a plate on the gradation obtained in half-tone negatives and the proofs from the resulting plates. Mr. Bloch thought that the shape of the curve had a considerable effect. Mr. Bull did not think that such relation was established.

At a somewhat late hour, Mr. Arthur C. Banfield described and showed the Trist three-colour exposure camera, a most ingenious piece of mechanism for the successive exposure of three (or four) plates for three-colour photography. Its essential feature was that mechanism was provided for setting the lens diaphragm at such apertures that the successive exposures of a panchromatic plate having any ordinary ratio of sensitiveness to the three colour-sensations could be made equal, the same shutter-setting then giving exposures in the accurately correct ratio. On this system the mechanism of the camera provided the means of exposing the three plates in very rapid succession. Mr. Banfield demonstrated the working of the camera by placing an electric lamp behind it and operating the plate-changing and shutter-opening mechanism. The time taken for the exposure of all four plates could not have been greater than five or six seconds.

Votes of thanks to the authors and readers of papers brought the proceedings to a close.

CROYDON CAMERA CLUB.

Mr. Handel Lucas gave a lecture on "The Science of Colour, and Artists' Vision." It was highly interesting in many ways, particularly in illustrating how a distinguished artist, whose paintings have many a time attracted considerable attention at the Royal Academy and elsewhere, need know but little about that branch of the science which relates to the admixture of coloured rays of light, as contrasted with the blending of pigments.

He began with an emphatic declaration of disbelief in the wave theory of light, and regretted time was not available to deal with the matter. Things then began to get a little mixed, and to speak candidly it was often difficult to understand exactly what the intrepid lecturer was driving at. However, he mainly sought to disprove the additive theory of colour vision by demonstrating that its fundamental principles broke down when applied to the subtractive system dealing with pigments instead of coloured light.

As is generally known, yellow is produced by the admixture of certain red and green rays, whether or not colour perception of yellow in Nature is entirely due to this fact. To prove the contrary, Mr. Lucas partially superimposed a disc of red gelatine over a similar disc dyed yellow, and placing the combination in the lantern, showed at the overlap only a dull nondescript colour, far removed from yellow, was transmitted. Other experiments on similar lines followed. A conviction was also expressed that if screen plates were coated with the three pigment primaries, viz., blue, yellow, and red, instead of blue-violet, red, and green as is customary, added brilliancy, and better colour rendering would be obtained.

In the discussion, Mr. Harpur said the lecture had "appealed to him very powerfully indeed." Other optical experts not being Joshuas, mostly preserved a discreet silence, for Mr. Lucas had intimated he would allow no apparently contradictory experiments to influence his mind unless the sun itself formed the illuminant. Unfortunately the orb had retired for the night. It was, however, arranged that three members—Messrs. Purkis, Hibbert, and Budd—should give an evening on the same subject later on which Mr. Lucas promised to attend. Being unblessed with artists' visions, it is anticipated that the cheerful triplets (who are doing well) will not find themselves in complete agreement with his views.

A most hearty vote of thanks was accorded Mr. Lucas.

On the previous Saturday a successful and enjoyable outing was held at the Watermeads, Mitcham, one of the many beauty spots acquired by the National Trust. With the exception of the Easter outing, rambles have met with little success in the past for reasons quite unknown. Mr. Walker, however, has recently been appointed excursion secretary, and if unflagging zeal and hard work can command success it is assured.

Ladies are even to be allowed to join some of the trips, which decision, arrived at in open meeting, filled Mr. Wadham with dire forebodings. With a mournful expression, of amplitude sufficient to cover a dozen funerals and a bit over, he maintained that the innovation meant the insertion of the thin edge of the wedge, and ultimate inclusion of the feminine sex as members of the club. "And that will be the end of things," he added, aghast at the petticoat peril

Commercial & Legal Intelligence.

LEGAL NOTICES.—At an extraordinary general meeting of the members of the Octophototype Syndicate, Limited, held at 224 to 228, Great Portland Street, W., a resolution was passed to the effect that the company be wound up voluntarily, and that F. W. J. Jackson, of Messrs. Jackson, Pixley, Browning, Husey & Co., chartered accountants, 58, Coleman Street, E.C., be appointed liquidator.

A supplemental dividend of 3¼d. in the £ has been made in the case of Frederick Parker (trading as F. Parker & Co.), picture framer and art dealer, 14, Clifton Street, Wolverhampton, Staffs.; and carrying on business at Chapel Ash, Wolverhampton. The dividend is obtainable at the Official Receiver's office, 30, Lichfield Street, Wolverhampton.

Notice is given of the dissolutions, by mutual consent, of the following partnerships: (1) Between Christopher John Grosvenor and Edward Grosvenor, carrying on business as photographers at Cowleigh Road, North Malvern, under the style of C. J. & E. Grosvenor. All debts due to and owing by the late firm will be received and paid by Christopher John Grosvenor. (2) Between Charles Ernest Watts, Walter Robert Hadler and Edward Prime, carrying on business as photographic process engravers at Colchester, Essex, under the style of the Essex Process Engraving Company.

News and Notes.

MR. H. C. PHARAOH, widely known throughout the photographic trade as formerly advertisement manager of the "Amateur Photographer," has been appointed advertisement manager of "The Referee."

A NOVEL WINDOW BILL is being circulated among dealers by Messrs. Amalgamated Photographic Manufacturers, Ltd. It is an exposure chart showing the exposure required for every Apem brand of plate.

War Grave Photographs.—Lieut.-Col. Stanley, on behalf of the Secretary of State for War, stated in last week's Parliamentary Papers that steps are being taken to arrange a contract to take photographs of war graves. Photographs will be sent to the relatives in due course.

Royal Institution.—On Tuesday next (May 30), at 3 o'clock, Sir Percy Sykes delivers the first of two lectures at the Royal Institution on (1) "Travel in Persia," (2) "Foundation of the Persian Empire." The Friday evening discourse on June 9 will be delivered by Mr. Joseph Barcroft on "Physiological Effects at High Altitudes in Peru."

Guilleminot Plates and Papers.—Mr Jules de Gottal, 17, Cecil Mansions, Marius Road, London, S.W.17, sends us a circular of the reduced prices just adopted for the plates and printing papers of MM. Guilleminot, Boesflug & Cie., and intimates that samples of any of the Guilleminot products will be sent to any bonâ fide professional photographer.

Mr. Pirie MacDonald, we are informed by the secretary of the Royal Photographic Society, has accepted the Society's invitation to form one of the selecting and hanging committee in the pictorial section of the forthcoming R.P.S. exhibition. Mr. MacDonald will arrive in England in time to take an active share in this work and in the Congress of the Professional Photographers' Association.

Rapid Photography.—The "Westminster Gazette" refers to a demonstration, given at the studio of the United Film Co., Hampton Hill, last week, when a woman was photographed and the negative developed and printed within two minutes after it had been taken. This process is the invention of Messrs. P. S. Kooistra and C. Dekker, who are both Dutch, and is known as the "Phodeko" developer.

Reflex and Press Cameras.—An excellent list of secondhand reflex and folding focal-plane press cameras has just been issued by Messrs. Sands Hunter & Co., 37 Bedford Street, Strand, London, W.C.2 The cameras are conveniently classified according to size, and full particulars given of every instrument. The list includes a very fine selection of all the leading makes, including a dozen reflexes in the 3½ x 2½ size. A postcard to Messrs. Sands Hunter will bring the catalogue by return of post.

Correspondence.

**** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** *We do not undertake responsibility for the opinions expressed by our correspondents.*

PHOTOGRAPHING AROUND WESTMINSTER ABBEY.

To the Editors.

Gentlemen,—As most of your readers probably know permits to photograph in Westminster Abbey and its Precincts are obtainable from the Dean, but it must not be imagined that the possession of such permit means that the photographer can start work. Something else, it appears, must be done before the photographer can make an exposure—officially, the Clerk of the Works has to be interviewed, and the permit from the Dean should, I think, be more carefully worded.

One official permit reads as follows:—"Westminster Abbey. Permit (name) to photograph the following views or objects in the Precincts, by arrangement with the Clerk of the Works:—(Particulars of subjects). (Signed) Herbert E. Ryle, Dean."

This does not mean, as some seem to imagine, that arrangements have been made by the Dean or his representatives, but that the photographer has to look up the Clerk of Works and make arrangements. If he does not there will be trouble.

The second part of the performance is more difficult than the first. The Dean's permit can easily be obtained by post, but the Clerk of the Works has to be seen.

Last Saturday twenty-two members of a well-known photographic society spent the afternoon in the Precincts under the leadership of an architect, when a hundred or so plates and films were exposed. Their happy wanderings were somewhat marred by the sudden appearance of an extremely officious gentleman, who called for the production of the permit and asked why arrangements had not been made with the Clerk of the Works as directed by the permit. A ten minutes' lecture on what the words on the permit really meant, or were intended to mean, followed, along with some comments on good manners and several other things—a most disturbing interview, and one distinctly out of place in such a beautiful and peaceful setting.

Happily for the photographers the official—who he was is not known—did not appear upon the scene until all plates and films had been exposed, and cameras were being packed up or pocketed. The incident, however, deserves to be recorded, and an explanation of what the wording on the official permit really means may be of assistance to your readers, and save them much annoyance should they ever use a camera in the Dean's Yard, Cloisters, and other parts known as the Precincts.—Yours faithfully,

South Suburban.

THE FOX TALBOT MEMORIAL

To the Editors.

Gentlemen,—The Council of the R.P.S. will shortly have under consideration the question of the particular form to be taken by the Fox Talbot memorial, the subscriptions to which total approximately £200. I shall be grateful if you will allow me, through your columns, to invite all subscribers to send to me, at 35, Russell Sq., W.C.1, any suggestions they may care to make on the matter. All such suggestions will certainly receive the careful consideration of the Council before any definite action is taken.—Yours faithfully,

W. L. F. Wastell.

CLOUD NEGATIVES.

To the Editors.

Gentlemen,—In a very interesting article in your journal of the 19th your contributor opens his remarks by saying that since Mr. Green, of Berwick, discontinued making cloud negatives they are no longer listed by dealers, and he presumes it is not an article of commerce any more.

It may interest you to know that if you refer to page 105 of our abridged list you will see that these are listed both in celluloid and in glass up to 1/1 plate size. They have never been out of our list; not only are they in the list which we distribute ourselves, but they are in the 100,000 dealers' lists which are sold and distributed by dealers themselves, and have been for years, and have never been discontinued.—Yours faithfully,

pp. W. Butcher and Sons, Ltd.,

Isidor Joseph, Director.

Camera House, Farringdon Avenue, E.C.4.
May 23

Liverpool Amateur Photographic Association.—After twenty-one years in Eberle Street, this old association has now removed to 21, Dale Street, where accommodation has been found, one minute's walk from the Exchange Flags, for club and workrooms. The use of a hall has been secured for lantern-lectures and meetings in the Church House, four minutes' walk away, at the corner of Lord Street and South John Street. The lecture hall is a handsomely furnished room, considerably larger than the old club room, whose capacity was often overstrained in past years. The opening house exhibition under the new conditions is to be a show of photogravures by Mr. John H. Anderson. By a happy coincidence the inauguration of the new series of exhibitions thus falls to a Liverpool man. So far as we are aware, Mr. Anderson has not previously exhibited in his native city. Amateur workers in the beautiful photogravure process are all too rare, and Mr. Anderson's work is likely to provide considerable interest among the Liverpool members and perhaps perturbation in the ranks of the Bromoil-transfer workers who claim for their process a beauty equal to that of photogravure.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

C. S.—As you seem to be clear in your own mind as to the rates which are commonly paid for reproductions in a newspaper of the kind in question (and we think they are about right), the only course is for you to send in your account and to press for payment as greatly overdue. A properly conducted paper would pay, as a rule, at the end of the week or month following publication. Assuming that the copyrights are your own property there is no reasonable doubt that you would be able to recover the amounts by suing the people in the County Court if such is necessary.

H. B.—It is not practicable to coat such large areas of polished surface with a matt preparation, such as could be employed for very small objects. Flashlight at night often will give better results when windows are in such positions that their images are seen reflected, but large quantities of powder are needed for such black objects, especially as the position of the flash must be well to the side. A sheet of newspaper held by an assistant will indicate whether the flash will show as a reflection. No means exist of preventing details on the board itself being reflected, but block-makers all employ skilled aerographists for obscuring such unwanted detail on the print.

J H.—It will be rather a difficult matter to get a really good-looking enlargement from the yellowed postcard. So far as ordinary photographic reproduction is concerned, the best thing that you can do is to make a copy negative on a process plate, and from that an enlargement, preferably on one of the slow gaslight papers, such as Cyko Professional. After one or two trials it would no doubt be possible to get a greatly improved enlarged copy of the postcard, but we really think that the best course in the end would be to send the postcard to a first-rate firm for the making of a platinum or carbon enlargement, leaving the people free to work up the enlargement at their discretion.

F L.—Ordinary M.Q. developer is quite unsuitable for the ferrotype plates. We enclose formula for a combined developing and fixing solution, which gives excellent results with these plates:—

Water, to make	40 ozs. fluid.
Hydroquinone	½ oz.
Soda sulphite	4 ozs.
Soda carbonate	4 ozs.
Hypo	8 ozs.
Liq. ammonia .880	2 fl. ozs.

Addition of more ammonia to the developer gives more vigour. The plates develop (and partly fix) in two or three minutes. They can then be examined in daylight and fixed in plain hypo.

J R.—(1) The F numbers corresponding to the various Goerz numbers are as follows:—

4.6	*f*/6.76
6	*f*/7.7
12	*f*/11
24	*f*/15.5
48	*f*/22
96	*f*/31
192	*f*/45

(2) The Endolithic Manufacturing Co., 60, Aldersgate Street, London, E.C.1, are large producers of cut celluloid labels and name plates. But most likely you would have to get the celluloid cut by a metal plate engraver, such as Mr. H. Cosins, 25, Wellington Street, London, W.C.2.

W. D.—There is little choice of shutters for large lenses, and of those available we think that the Packard Ideal is by far the best. There is one model of this which gives instantaneous exposures as well as time, the speed varying with the quickness with which the bulb is compressed. Exposures of less than half a second may be given on the time setting, and we have found that the sensitiveness to the bulb action may be increased by dropping a few small wire nails into the hollow piston, so that the recovery when the ball is released is quicker. We do not think that the risk of producing pinholes by dust disturbed by a flap shutter is great, as the inside of the camera ought to be kept clean. For many years flap shutters were almost exclusively used in the studio, in days when the average negative had to be much more perfect than it is now.

R. G.—There is no special dictionary of photographic chemicals, at any rate not in English. Valenta's "Photographische Chemie" is an excellent work which deals with the properties, chemical and photographic, of the substances used in photography. But you will find the properties and uses of practically every photographic chemical in Cassell's "Cyclopædia of Photography," now out of print, but on the shelves of the library of the Patent Office, 25, Southampton Buildings, W.C., which is open to the public daily. In the alcove containing chemical works you will also find large chemical treatises in which information on practically every substance can be found. One rather good and recent work is the "Condensed Chemical Dictionary," issued in 1919. Although it is an American book, we expect they have a copy in the Patent Office library.

O. P.—(1) If, as we suppose, the developer is for films, we do not think you should use metol hydroquinone instead of pyro. The developer may be cheaper to make up (we have not worked out whether it is or not), but as regards the quality of the results, we think pyro is much the better. However, a formula is as follows:—

Metol	¾ oz.
Hydroquinone	2¾ ozs.
Sulphite	2 lbs.
Carbonate	1¼ lbs.
Potass bromide	200 grs.
Water	10 gallons.

(2) The yellow filter used for the Paget colour process will have a certain correcting effect on an anti-screen plate, but nothing very substantial. It is quite unsuitable for use on ordinary plates, as it will prolong the exposure considerably without any material advantage. (3) It is a very bad plan to soak negatives after fixing and washing in 5 per cent. solution of sulphuric acid. Any traces of hypo left in the film are decomposed, and are liable to give rise to stain in course of time. Also, the film is rotted to a certain extent unless the acid is very thoroughly washed out. A much better plan would be to wipe the water from the negatives as completely as possible with wash-leather, or by running a roller squeegee over them, and giving a final soak in a couple of baths of distilled water, or in a weak solution of citric acid, which is a very mild acid, without the injurious effects of sulphuric.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3239. Vol. LXIX. FRIDAY, JUNE 2, 1922. Price Fourpence.

Contents.

SUMMARY.

In a contributed article Mr. F. H. A. Hall describes a method of measuring the speed of a focal-plane shutter in which an exposure is made with a shutter of known speed whilst the slit of the focal-plane shutter is travelling across the plate. (P. 323.)

Our contributor "Pelham Swinton" begins the last of the series of articles on the business side of professional photography, dealing with the persuasive or legal methods to be followed in collecting accounts. (P. 324.)

In a leading article we deal with mechanical questions respecting the efficient glazing of the studio. (P. 322.)

In France a local society has been formed with the object, among others, of discovering infringements of photographers' copyrights in portraits by newspapers and others. (P. 321.)

The Edinburgh Society of Professional Photographers proposes to hold a congress, fair and exhibition in Edinburgh next March. (P. 322.)

The Lancashire Society of Master Photographers held a successful conference at Blackpool on May 17 and 18. (P. 329.)

Professional photographers in North Yorkshire and South Durham have formed an association. (P. 330.)

The Photographic Convention will be held at Shrewsbury from July 3 to 8, under the presidency of Mr. C. B. Clifton. (P. 330.)

Mr. D. Charles recommends and describes a form of lens hood consisting of a collapsible frame attachable to the camera front. (P. 326.)

At the Croydon Camera Club last week, Mr. Arthur S. Newman sketched the evolution of the hand camera. (P. 328.)

Flexible sensitive film without gelatine emulsion is the subject of a recent patent. (P. 327.)

Picture postcards may now be sent with a halfpenny stamp and without deletion of the word "postcard" on the front, provided that they bear no message beyond five words of conventional greeting. (P. 321.)

"COLOUR PHOTOGRAPHY" SUPPLEMENT.

Mr. J. G. Arch, in a contributed article, describes how a repeating back for the taking of a set of three colour-sensation negatives may be made by those of quite moderate experience in the use of tools. (P. 21.)

We describe a laboratory and screen demonstration of a process of colour cinematography which has been worked out by Mr. Aron Hamburger. A single film has images on each side of it, and is simultaneously treated on both sides with four dyes, which are then caused to form a dye image by treatment of the film in a special bleaching bath. (P. 23.)

A contributor describes a fitment for small roll-film cameras permitting of the exposure of Paget colour plates. (P. 24.)

M. J. Carteron, in "La Photo-Pratique," strongly recommends preliminary desensitising of the Autochrome plate with phenosafranine. (P. 23.)

The conditions which chiefly apply to the display of Autochrome and Paget colour transparencies are the subject of a note by Mr. R. M. Fanstone. (P. 22.)

At the R.P.S. recently Mr. Wastell foreshadowed an entirely different process of colour photography. (P. 24.)

EX CATHEDRA.

Postal Improvements. The reduction in the charges for letters and postcards which came into operation on Monday last is, perhaps, not the most substantial part of the steps which are being taken by the Post Office towards the pre-war postal facilities. The resumption of Sunday collections of letters will be particularly appreciated by those carrying on any business which receives orders by post. Newspapers, in particular, have had reason to appreciate the fact that many of the people who send small advertisements draw them up on a Sunday, and that consequently, in the absence of Sunday collections, such advertisements have been late in arriving and, moreover, during the absence of the Sunday collection, have been fewer in number. The publishers of the "B.J." have to deal with some hundreds of advertisements each week, and, therefore, we take this opportunity of pointing out that it is an advantage, as regards certainty of insertion, that such advertisements should come to hand during the Monday of each week. Among the other concessions that have been made, we are glad to see that the Postmaster General has admitted view postcards for transmission at the halfpenny "printed papers" rate without insisting on the deletion of the word "postcard" on the front. When sent at this rate cards must, of course, bear no message beyond five words of conventional greeting; a view card which bears an informative message must be stamped at the full penny rate. The concession removes what has long been an absurdity, and will, no doubt, do much to revive the popularity of the picture postcard.

* * * *

Copyright Infringement in France. An example of a piece of protective organisation in the interests of photographers is described in the current issue of our professional contemporary "Le Photographe." Although photographers obtain copyright in their work in France, their position has never been as strong as in this country, and no doubt rights have been greatly abused by publishers of newspapers. As a step towards the detection and prevention of such infringers a local society has been formed, named the Société des Auteurs Photographes de Normandie, having its headquarters at 75, Rue Thiers, Rouen. In addition to publishing information on copyright law as it applies to photographs, the Société examines the newspapers in its district and compiles a list of the portraits of people which are reproduced without acknowledgment to the photographer, and thus, presumably, in many cases without the photographer's authority. Such lists are to be published from time to time in our contemporary. The first instalment contains the names of about fifty people, and gives such brief description of each portrait as will enable its author to identify it. Those who thus have reason to think that

their work has been reproduced without their permission will apply to the Société for particulars of the name and issue of the newspaper which, it is judged, has published the work without permission. It will be interesting to see whether this local detective work proves effective in bringing the infringers to book.

* * *

Scottish Fair and Congress. With the caution which characterises our friends north of the Border, the Edinburgh Society of Professional Photographers is anxious to ascertain the views of the photographic trade respecting a congress and fair which it is proposed to hold in March next in the new exhibition hall which is being built in Edinburgh. The hall, measuring about 270 ft. square, will be fitted with more than 100 stands, supplied with water, gas and electric power and light. The Edinburgh Society, which has shown itself an exceedingly active and efficient association, proposes to organise exhibitions in the same hall of amateur photography and of professional photographic portraiture. It is felt that the Scottish capital is a centre which will draw large numbers of visitors, and that Scottish photographers will welcome the opportunities of seeing apparatus and of taking part in a congress dealing with the technical and commercial sides of their business. A floor plan of the hall and drawings of the stands are obtainable with other particulars from the secretary of the Society, Mr. Allan Lowson, 116, Hanover Street, Edinburgh.

STUDIO GLAZING.

THERE are many points to be considered when constructing a new studio or re-glazing an old one, and, unfortunately, errors in judgment at such times are costly and troublesome to correct. The selection of a suitable glass is an important matter, especially when the studio is so situated that direct sunlight falls upon the glazed portion for any period during the day, or where it is desired to shut out the view of passers-by or neighbours. In the majority of cases a good heavy "horticultural" glass, such as is used for conservatories, will be as effective as any and less expensive than most. It is usually supplied in two weights, 15 oz. and 21 oz., the latter being preferable, particularly for the roof. Plate glass is sometimes used, but there is not sufficient advantage to be gained to justify the extra cost. Moreover, the original hard surface having been ground away, it is more likely to be attacked by the weather, the surface becoming rough and retentive of dirt. Also, some qualities will darken considerably by long exposure to light, thereby causing an appreciable increase of exposure.

When it is necessary to prevent overlooking, the most obvious thing is to use ordinary ground glass, but it is by no means the best material, as it quickly becomes dirty and smoky. It is not easy to clean, soapsuds and a brush being necessary, which is not convenient in most studios. For the purpose in question and also for diffusing direct sunlight, what is known as "rolled plate" is very suitable. It is a rather thick glass, one side being smooth, while the other, which should be placed inside, is covered with fine ribs or grooves. These grooves should be placed so as to run from the ridge to the eaves, and not transversely. This facilitates cleaning, as the grooves being smooth give up the dirt readily to an ordinary wet leather. Fancy glasses, such as Muranese and similar patterns, should never be chosen, as they are very difficult to keep clean. There is a variety of glass which has a surface similar to hammered metal. This should be avoided, as in direct sunlight it is liable to give a mottled effect if the sitter is placed near to it. Whatever style of glass is chosen the colour should be studied and the whitest sample selected, as this will have a slight effect upon the exposure, enough to be worth considering in dull weather.

The sash bars may be of wood or metal. When first cost is not the primary consideration the latter should always be specified, for not only do they obstruct less light but they are stronger and better adapted for puttyless glazing. Leakage is a chronic trouble in many studios owing to the putty shrinking away from the bars. This is entirely obviated by choosing one of the many systems, now available, of fixing the glass by means of leaden strips which grip the edges of the sheets, any water which may pass under being carried away by small gutters which form an integral part of the sash bars. This plan can also be adapted to wooden sash bars, and in either case, ease of replacement of broken panes is a valuable feature. If, for the sake of cheapness, the old wooden bars are used, leakage may be minimised by mixing about one-third of real Stockholm tar with good ordinary putty. This mixture never becomes quite hard, and consequently does not shell away from the wood. Before glazing, the sash bars should receive two coats of good paint, and the glass should be set in before the second coat is quite dry.

When setting in the glass, care should be taken that the panes are not quite in contact at the overlap, as this will often cause a drip, through the water being drawn up by capillary attraction. Wide overlaps should be avoided, for if dirt is allowed to accumulate in them there is a loss of light besides an unsightly appearance.

The "pitch" or angle of the roof is a matter of some consequence, and the question of steep and flattish roofs has often been discussed. It has been claimed that less light is lost by reflection from a roof with an angle of 25 deg. than from one of 40 deg., but in practice the loss is small and there is a distinct advantage in the steeper pitch, as it is kept cleaner by the rain and will not allow so heavy a load of snow to accumulate before slipping. The single-slant light which has an angle of over 60 deg. gives less trouble in every way than the ordinary ridge roof, and is well worthy of adoption, if it is not necessary to provide for taking large groups.

When erecting a studio, the question of the amount of glass necessary usually arises. Modern practice calls for a much smaller light than was formerly considered necessary, but it is not wise to limit the extent of glass which can be used if need be. In a very large studio the area of glass may be small in relation to the total size of the roof, but in such a studio a great variety of lighting can be obtained by moving the sitter or the camera. In a small narrow studio this is not possible, and if it be desired to obtain the same effects, it is necessary to alter the position of the light. Therefore, in a studio, say 20 feet by 12, there should not be more than four feet of solid roof at each end, and at the end at which the sitter is usually placed the glass may extend to the end wall, so as to allow the light to come from behind the model.

A good deal of glass is generally wasted by having the side light too low. It is rarely necessary for this to come lower than four feet from the floor, thus saving a row of blinds, as well as avoiding risk of breakage and keeping the studio cooler in summer and warmer in winter.

Regarding the question as to the advisability of glazing at least a part of the side of the roof opposite to the principal light, it may be said that this plan is rarely adopted by the most experienced photographers. In

many studios, where glass has been so fixed, it will be found to be painted over or covered outside with felt or iron sheeting. In a few cases where the studio runs from north to south, glass and blinds are provided on both sides, so that in sunny weather one side may be worked in the morning and the other in the afternoon, but even with this orientation a skilful operater will manage to do good work with a one-sided light.

MEASUREMENT OF THE SPEEDS OF FOCAL PLANE SHUTTERS.

THE writer has recently designed a piece of apparatus for the testing of speeds of focal-plane shutters. The object aimed at was to give, by means of a front shutter of *known* speed, a comparatively large number of exposures during the time taken by the slit of the focal-plane shutter in travelling from top to bottom of the plate. This, as Fig 1 shows clearly, will

Fig. 1.

give an image of the slit for each exposure by the front shutter, and a simple calculation based on the number of images, the number of exposures per second front shutter, and the width of slit, will give the effective exposure of the focal-plane shutter.

The reliability of the test depends entirely on the speed of the front shutter being measurable. The most accurate and constant method of making the exposures, it seemed to me,

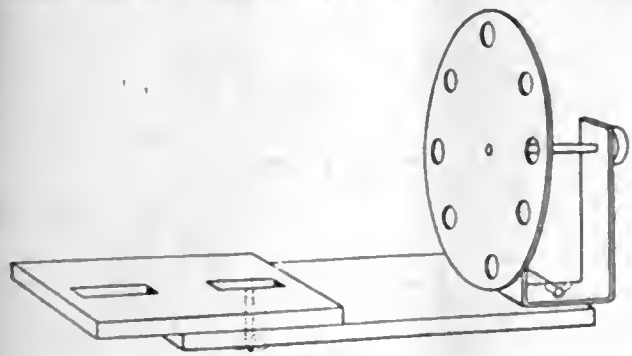


Fig. 2

was to use a falling weight, which, as is well known, completes 16 ft. in one second. This gives for 4 ft. (about the average for a tripod) a speed of 8 ft. per second at the *end* of the fall.

A disc of thin card (Figs. 2 and 3), about 6 in. diam., is mounted on a spindle passing through two bearings and carrying a grooved pulley on the outer end. The disc has 8 equally spaced holes punched in it, $\frac{3}{4}$ in. diam., allowing sufficient margin from the edge to act as a light trap; say, from the outside edge of the hole to the edge of the disc $\frac{3}{4}$ in. A piece of card with a $\frac{1}{2}$ in. hole in the centre is fitted in the front of the lens mount to allow the smallest space consistent with free running between the disc and the lens front.

The bearings for the spindle are made by bending a strip of brass $\frac{1}{2} \times \frac{1}{8}$ in. twice at right angles and drilling holes in the free ends for the spindle to pass through. The base of the bearing bracket is clamped to a wooden support 1 in. square by about 6 in. long. This piece is again clamped to a similar piece which should be long enough to reach under the tripod head so that one screw will serve to attach the camera on top and the apparatus from below by using a longer $\frac{1}{4}$ in. Whitworth screw than the one supplied with tripod. It will be found to add greatly to the convenience of adjustment if the supports are slotted at each joint and small bolts with wing nuts used instead of ordinary screws.

A weight of about 3 lbs. is attached to a length (4 ft.) of strong thread with a loop on the opposite end, which is placed

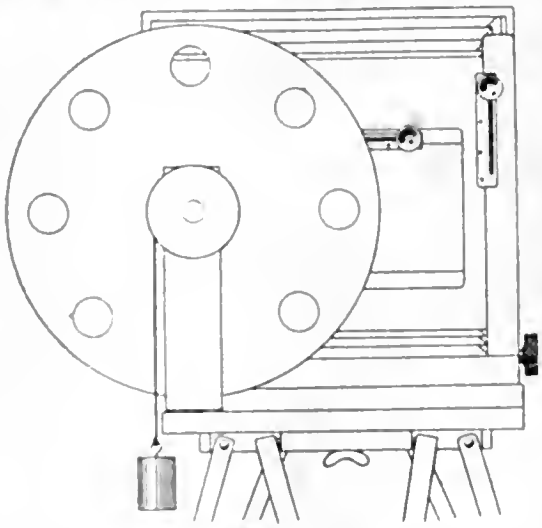


Fig. 3.

over a small pin driven into the bottom of the groove in the pulley. The weight is wound up to the top and held in position by a loop of thread placed over end of spindle. Fig. 2 shows the apparatus detached, and fig. 3 in position of use.

The shutter is now set with a *narrow* slit and wound up, the dark slide put in and the shutter drawn. The camera is pointed to a clear space of bright sky. The loop of thread which holds the weight from falling is cut through and the focal-plane shutter is released just as the weight strikes the ground, at which moment the disc will be revolving at its maximum speed. On development the negative will be found to be crossed by a number of dark bands which are images of slit, the actual number varying with the speed of the focal-plane blind. There is no need to hurry in pressing the release

as the time taken for the weight to attain its maximum speed is quite sufficient to allow of reasonable deliberation. With shutters having a fixed tension and obtaining variable speeds by altering the width of slit only, one negative will give the data required. If the speed is altered by winding up a tension spring a fresh negative must be made at each tension, as the actual speed of the blind is not then constant.

The diameter of the pulley on the fixture described is 1 in.; that is, 3.141 in. circumference.

The speed of the weight (maximum) is 96 in. per second: 96 divided by 3.141 = 31 (approx.), so that the disc makes 31 revolutions per second.

There being 8 holes in the disc, each exposure represents 1/248 second (8 × 31 = 248). The number of dark bands shown on the plate divided by 248 gives the fraction of a second taken by the focal-plane blind to complete its travel, and this divided by the number of slit-widths contained in this height of plate denotes the *effective* speed of focal-plane shutter.

Taking Fig. 1 as an example—

Width of slit was	.10 in.
Height of plate	3 in.
Number of slit widths in 3 in.	30
Number of images of slit	15
Speed of front testing shutter	1/248 sec.

1/248 ÷ 15 = 1/16.5 sec., which is time of travel of blind. This is multiplied by 30 (number of slit widths in plate). 16.5 × 30 = 485 gives the *effective* speed of the focal-plane shutter as 1/485 sec.

Fig. 4 is a print from a negative of an express train, using the same width of slit, taken at about 45 deg., and moving some 40 miles per hour. I have enlarged it as nearly as possible twice *linear*, and though there is a *slight* advance of the upper portions, the funnel and dome, owing to the time taken for the slit to pass over the distance from the rails to the highest part, it would not be noticed unless specially looked for. I merely include this as a sort of corroboration of result of the test, as the shutter speed indicated agrees very closely with that given in the tables in the almanac for such a subject.

There would be no advantage in increasing the speed of the front shutter to any great extent, as a speed would soon be reached when the image of the slit would overlap, or even two exposures of front shutter might take place before the slit had time to travel its own width. The method, for this reason, is only available for narrow slits, from the results of which tests the slower speeds are easily ascertained. With shutters with fixed tensions one test negative will serve, but where the speed is altered, both by variations in tension and width of slit, a separate test negative must be made for each tension.

There is another point in the analysis of the movement of the blind which is clearly shown on the test print, *i.e.*, the

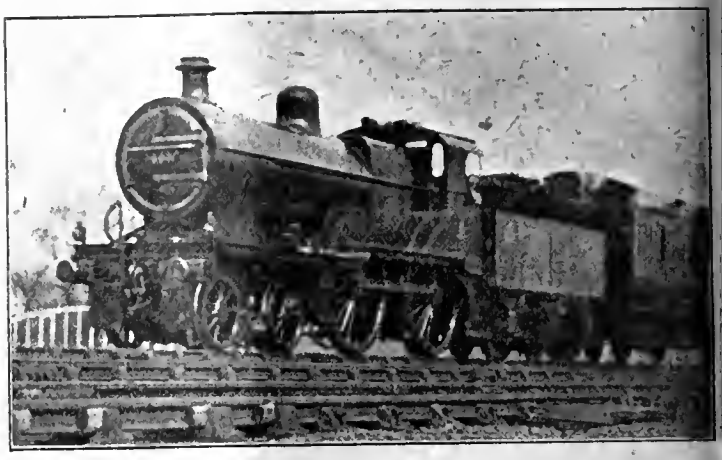


Fig. 4.

acceleration; the dark bands are close together at the top and get wider apart till about the half distance, beyond which position they are nearly equidistant, showing that the blind has then reached its maximum speed. This might suggest some advantage from giving the blind a longer travel than actually needed at the top, so as to overcome inertia before commencing the actual exposure, the extra time being allowed for by releasing shutter a fraction of a second early. I intend to make further tests with the blind running upwards, and also with slit vertical, which should show whether there is any great advantage to be gained by running the blind in the opposite direction to movement of object.

F. H. A. Hall.

THE BUSINESS SIDE OF PROFESSIONAL PHOTOGRAPHY.

[The subject of the last of the chapters on the business side of professional photography, namely, the collection of customers' accounts, provides our contributor, "Pelham Swinton," with special opportunities for exhibition of his mordant wit and shrewd insight into human nature. The whole chapter is unfortunately too long for completion this week, but its appearance in our next issue will end the present series. Previous chapters have been:—"The Economic Position of the Photographer" (April 28); "The Photographer and his Client" (May 5 and 12); "The Photographer's Clerical System" (May 19); and "The Photographer's Costing System" (May 26). We think that those who may have overlooked any of the previous papers will be grateful to us for these references.]

V.—THE ART OF ACCOUNT COLLECTING.

In those far-off dark ages when our rude forefathers knew not the use of money, and conducted their commercial transactions by means of barter, I think it hardly probable that any system of credit was in practice; and such things as bad debts, or the expenses involved in the extraction from one man that which belongs to another, are evidently the growth of politer periods. Credit, in a more or less nebulous form, first made its appearance in the Middle Ages when the noble lord took from the vassal, or from some weaker person, that which he had a fancy for without any intention, either tacit or implied, of payment or restitution. During the eighteenth and early nineteenth centuries, when one of the measures of a gentleman was the volume of his financial obligations, morality had advanced so far that intention of repayment was always implied. Nowadays, the moral and legal necessity to pay for whatever one purchases is almost universally admitted; but we have not yet arrived at a state in which it is universally practised.

The custom of giving and taking credit, one of the direct inheritances of the feudal system, has been found by economists to be not entirely harmful, in that, when used with moderation, it supplies the very necessary oil for the wheels of

commerce. As a lubricant, therefore, it is a blessing; but when it is allowed to develop to such an extent as to transform a business into a polite form of loan institution for the benefit of an improvident public, then such credit is a curse both to the trader and to the community.

The broad principle of the advantages of retail credit is simple. When I require a new suit of clothes, it would be a great inconvenience to me if I were obliged to visit my bank, draw a sum which I calculated would suffice, and then proceed to my tailor, money in hand. To the tailor it would be equally a disadvantage. The trouble involved to myself might cause me to postpone the purchase until another day, and by then I might have decided that the old suit would last another year. Thus there is inconvenience caused to me, and a possible loss to the tailor. Under conditions of credit, however, I walk into the shop when I happen to be in that district, order my suit, and, at a convenient date, send him a cheque for the debt incurred. Further, when I know that I have an account standing against me with the tailor, I am tempted to purchase from him several extra small articles of which I am more or less in need, but which I might hesitate to buy were I obliged to pay cash on each occasion. This, again, is an advantage to the tailor, and for such advantage he is willing to forgo immediate payment for his goods, or, in other words, to lose interest on the amount of my account—for a certain limited period. But if that period be extended by me for twelve or fifteen months, then the tailor will begin to wish that I had purchased a little less and had paid more promptly.

The value of credit to the retailer, therefore, has very definite limits, and, to the public who purchase from him, it is merely a matter of convenience and does not involve any of the complications associated with high finance. There is consequently no reason for the extension of such credit beyond that period which affords the convenience described. One month is an ample period to serve such a purpose, and there is no logical argument which could prove it inadequate. A man may exclaim: "O, but my salary, or my dividends, are not due until six months hence. I cannot possibly settle my accounts till then." This is not an argument. It is merely an admission that he is living in advance of his income—a state of affairs which he should never have permitted. If, however, such is really the case, and the circumstances were unavoidable, then let him borrow the necessary money honestly, at an interest per cent., instead of forcing the retailer to finance him at no interest at all.

Many photographic firms conducted on the credit system have long been in the habit of permitting accounts to remain unpaid for absurd and uneconomic periods. I say this with conviction, because my own firm was one of these. In some cases this state of affairs is due to laxity; but in the majority of businesses it is the result of sheer moral cowardice. The creditor is afraid to press the debtor lest he should lose his custom. Can anything be more pitiable, more disgustingly servile? In a country where so much is talked about freedom and justice, one would hardly imagine such circumstances possible. Yet they exist every day, and in all kinds of businesses, where nineteenth century methods hold sway.

The position is plainly this. The photographer makes a contract with the customer to supply a certain number of portraits of a certain size, in return for which he shall receive a certain agreed sum of money. It is simply an exchange. If the photographer has performed his part of the contract to the satisfaction of the customer, then there exists no reason, either ethical or legal, why the customer should not fulfil his or her agreement to the satisfaction of the photographer—i.e., within a reasonable period.

The truth of the matter is, that the photographer's fears are entirely misplaced. He fears to offend a customer, but he has evidently no fear of the scarcity of floating capital which such conditions create. He has no fear that he will be rendered unfit to compete with his rivals in normal times, and he has no fear of bankruptcy should trade become bad. Rather let him fear these things. It is the man who has floating capital in hand who can outrun his competitors, and it is such a man who, in times of depression, can stand securely until better days. And, as regards the offending of the customer, this is but a children's bogey, which disappears in the light of up-to-date and reasonable methods.

A human being withholds payment of a debt, for at least one of four reasons:—Either through forgetfulness, through dissatisfaction with the goods supplied, through a temporary inability to pay owing to financial embarrassment, or through a determination to pay nothing until compelled to do so. To do justice to human nature, the first cause is the most common, especially in the case of small accounts; and it is for the individual photographer to see to it that the second cause is made as uncommon as possible. The third cause is probably nearly as common as the first; while the fourth is merely an evidence of the spirit of the Middle Ages still among us. This, fortunately, is not so much in evidence as it was ten years ago. The growth of morality is like that of education, very slow; and to certain types of persons it can be introduced only by means of a surgical operation. The minds of persons who have been educated to regard tradesmen, and people who buy and sell, as beings of an inferior creation considerably lower than the angels, and whom, in consequence, it is no dishonour to cheat, have recently been bathed in a flood of democratic light. This influx has had a most salutary effect; but it required nothing less than a European war to create the necessary cranial fissure.

In the event of payment of a debt being withheld on account of dissatisfaction with the goods supplied, no breach of contract is evidenced, as the contract on the part of the creditor has not been fulfilled. The customer, however, has no right to delay to inform the creditor of this, otherwise, he is at fault. As a rule, however, people are quick to point out shortcomings or mistakes, and do not usually delay this beyond the rendering of the first account.

With regard to the other three causes of delayed payment, what is the photographer to do? A repeated rendering of the account at fixed intervals for an indefinite period of months or years, is the usual and time-honoured procedure, and, if payment is not made by a date coincident with the expiry of the photographer's patience, the matter is placed in the hands of a solicitor or debt-collecting agency.

Now, a letter from a solicitor or agency has an extraordinary psychological effect. No matter how carefully or courteously worded, it is always described by the recipient as "insulting." Everyone knows the curious reflex action of the nerves of the leg, when, sitting with knees crossed, the bone below the upper knee is struck sharply. The foot and leg jump forward involuntarily, and cannot be controlled. In the same manner, a debt-collecting letter from a solicitor seems to strike some similar spot in the brain, and the recipient immediately cries out "insulting!" I have known some who felt so outraged as to threaten legal action against the sender—and this, be it observed, after months of weary account-rendering in a humble endeavour to obtain one's own.

It is advisable, therefore, as far as is possible, to keep one's fingers from contact with this tender spot in the human mentality. However inconsistent or ridiculous it may appear to the normally-minded, some persons do feel righteously aggrieved at this request for payment of a debt. And here is the whole point. It is not so much the request at which they are incensed, but on account of the person who makes the request—the fact that the letter is from a solicitor. In describing the communication as "insulting," therefore, they seem to be unable to distinguish between the phraseology of the letter, and the implication of its origin. Thus, if such a letter be sent by the photographer himself, the debtor will not feel insulted at all. In fact, the photographer may write

in very much stronger terms, and still the recipient will feel no insulting effects.

Why, then, should the photographer cause offence to his customers in this manner? To offend customers is to lose them; and the only customers whom he can afford to lose are those of class No. 4 who endeavour on principle to evade all debts. Obviously, these are the only people who are deserving of the solicitor's attentions. The other two classes—1 and 3—are more or less innocent persons—the one type careless and forgetful, and the other financially embarrassed. Each of these, therefore, must be treated separately, and they are distinguished the one from the other by a simple process of filtration, or sifting. Here it should be mentioned that the photographer is wise who sends out his accounts every month. Longer intervals than this mean bad debts, and awkward scarcities of ready cash. A large number of persons never pay an account until it has been rendered from two to four times. If, then, a man renders his accounts quarterly, he must be prepared to wait from six to twelve months for the average customer's payment. If he prefers to do this, I have no quarrel with him; but I prefer to put my floating capital to more productive uses. Further, it is an excellent plan to place an account beside the photographs when the order is despatched. This offends no one. Old customers treat it as an invoice, and it assures that no misunderstanding can arise regarding the price charged. While—most important factor of all—it is surprising how many people will be found to pay within a few days of the receipt of the order.

The reason of this is important. When I purchase almost any other commodity (excepting food), I am still in possession of the article when the account has to be paid. But, when I purchase photographs, the first thing I do is to scatter them broadcast among my friends; and, when the account arrives, perhaps a few months later, the folly is past and well-nigh forgotten. This rude reminder is most unpleasant. The money which I had arranged to set aside for the photographs has been spent a month ago on something else, and, the cause of this account being no longer present to give me a feeling of value received, I naturally look upon it as money thrown away. For these various reasons, therefore, the account is put aside, where it is forgotten, and where it lies unpaid for months. On the other hand, if the account is enclosed with the photographs, it is highly probable that I shall settle it almost immediately, while I am interested in the photographs and while the cash is at hand, for people rarely indulge in a luxury unless they have the money to pay for it. There is, therefore, nothing to be lost and everything to be gained by the photographer encouraging his customers to pay their accounts as quickly as possible. But how? Here I must break off for lack of space and postpone my discussion of the practical side of account collecting to next week's issue.

PELHAM SWINTON.

THE IDEAL LENS-HOOD.

THE ideal lens-hood, like any other ideal photographic apparatus, does not exist. The fact is that comparatively few photographers fully realise the advantages of a lens-hood at all.

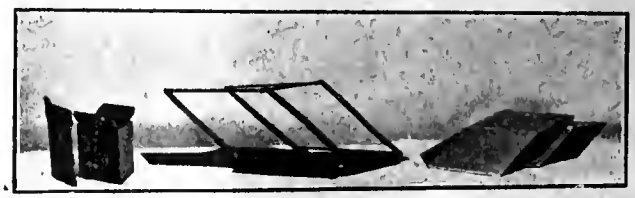
Perhaps it would be as well to state the qualities which the ideal lens-hood should possess, in my opinion:—Firstly, it should cut off brilliant light which is not part of the subject, and which would otherwise strike the lens and flatten the image on the plate. That, it will be said, is the sole purpose, the be-all-and-end-all of a lens-hood. Agreed, but still there is a second. It should cut off all such extraneous light without itself intruding on to the plate, and should therefore be adjustable to various lenses and extensions of a camera. Thirdly, too, it should not take too long to attach and remove, and it should not occupy more than its fair proportion of space or weight in the camera bag.

The larger and the more distant the opening of the lens-hood the more closely it can be adjusted with ease to cut off all image that is not going to form part of the picture. Also, if one can prevent the inside of the hood from presenting a bright surface when viewed from the rear, it is obvious that as regards photographic qualities we shall have attained our ideal. There are, however, matters of convenience that have to be studied. The form of hood which consists of bellows connecting two wooden frames is a fair approximation to the ideal as regards technical efficiency, but if employed of a size that permits of accurate cut-off as well as the use of a rising front, etc., it is often considered rather cumbrous, though this would not be a serious objection were it made in such a way that it permitted of rapid and easy attachment to a variety of lenses, large as well as small, such as the commercial worker has to carry.

The lens-hood which I propose to describe is one which meets these objections, inasmuch as it is not attached to the lens at all,

but to the camera front. Any objections to its bulk are met by the fact that, when collapsed, its dimensions are practically of area only, its thickness being less than a quarter-inch, so that the space it occupies in the camera-bag is negligible. As the cost of the materials for making quite a large one is less than sixpence, it will be appreciated that a great step nearer to the ideal has been accomplished.

These materials consist of thin cardboard and book-binders' cloth, with thin glue as an adhesive. The card is cut into the necessary pieces, all of equal size, which are stuck upon a strip of the cloth with about 3/16 in. space between each for flexibility in folding. Another strip of the cloth is stuck on the other side, and, of course, each strip has an end which overlaps and makes a secure join at the fourth corner. For average lenses the best dimensions are in the proportion of four-by-three; that is to say, the opening would be four inches square and the depth of the hood from front to back would be three inches. By adding side wings of narrow strips it becomes possible not only to have some little control over the size of the opening by tucking these wings more or less back inside the walls of the hood, but it is found that this very simple addition makes an intense black shadow just inside the opening of the hood, which thus forms a far more effective cut-off than a plain opening. The difference in effect is astonishing when first seen, but in practice it will be found quite sufficient in the vast majority of cases to have wings at two sides only. To obtain the greatest range of adjustment it is very desirable to have a double hood, i.e., an outer hood which slides over the one attached to the camera, and to have the wings upon the outer hood. There are several ways



in which the hood can be attached to the camera, the best being simply that in which two small round-head screws are fixed in the camera-front coinciding with holes in wings at the back of the hood (not to be confused with the front wings previously mentioned). A rubber band round the hood catching under the heads of these screws will prevent any chance of slipping off. The outer hood is simply slipped over this one and slid backward or forward according to the lens in use, and for wide-angle work the inner hood is used alone. The illustrations show hoods constructed on these lines, open and partly closed for packing. A hood on similar lines for use where the lens is mounted in a diaphragm shutter is also shown. The frame is made of hard brass, and is supported on the camera front by keyhole slots which fall over the same screw-heads, and the outer hood slides over this in the same way.

The brass strips forming the front of the frame make a non-reflecting diaphragm inside the hood just as the cardboard wings do.

The best size to make a hood is the largest that the camera front will carry conveniently. So long as the proportions are the same the larger hood will cut off exactly the same amount of outside light, but with less risk of vignetting. Anyone who has ever tried shading his lens with his hat or with the baize partition of his camera-case, and has found half his picture cut off, will appreciate the advantages of a hood of this kind which will, moreover take up no more room than the said partition.—D. CHARLES.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications May 15 to 20 :—

VIEW-FINDER.—No. 14,173. View-finder for photographic cameras. E. H. Binney.

CAMERAS.—No. 14,307. Photographic cameras and printing apparatus. H. R. Eason.

PANORAMIC CAMERAS.—No. 14,057. Panoramic cameras. De P. M. Paulson and S. Richards.

TRANSFER PROCESSES.—No. 14,074. Final supports for photographic transfer processes. T. W. Ellis.

TELEGRAPHIC TRANSMISSION OF PICTURES.—No. 13,902. Method of transmitting pictures by telegraphy. B. S. Clay.

COLOUR CINEMATOGRAPHY. No. 13,803. Colour cinematography. H. May.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country, or abroad, in the case of patents granted under the International Convention.

CELLULOSE FILMS.—No. 162,266 (April 19, 1920). An aqueous solution of potassium iodide is prepared in which silver iodide is dissolved until the solution is saturated.

The film is then immersed in the bath. As soon as it is sufficiently impregnated it is withdrawn and squeezed, and then soaked in water. The resulting dilution of the potassium iodide solution sets free a large quantity of silver iodide which is deposited in the interior of the film, and renders the latter sensitive.

The same result can be obtained by using in place of the silver iodide solution above referred to, for example, a warm solution of silver bromide in an aqueous solution of an alkaline bromide.—La Celiophane (Société Anonyme), 16, Rue de Louvre, Paris.

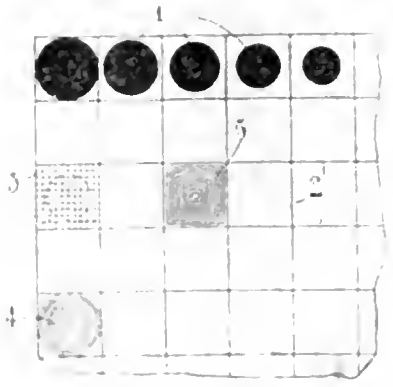
TELEGRAPHIC TRANSMISSION OF PICTURES.—No. 178,145 (October 14, 1920). The invention relates to the transmission of pictures by telegraphy; line or wireless, and is particularly concerned with pictures produced by process blocks, i.e., pictures built up of dots equally spaced, and of a size varying with the degree of light or shade.

A series of signals corresponding with the various sizes and positions of dots is transmitted and utilised at the receiving end to print mechanically dots of corresponding size and position whereby a reproduction of the original picture is built up.

The picture is first enlarged to such an extent as to enable each dot to be readily recognised according to its size by an operator, who then transmits signals corresponding with the various sizes of dots which occur in sequence in a row, these signals being used at the receiving end to operate mechanism whereby dots corresponding in size and position to those on the original picture are reproduced, thus building up a picture corresponding to the original.

The invention also consists in means for enabling the dots to be readily recognised according to which two series of lines at right angles to each other are superposed upon the enlarged picture at the transmitting end so as to form squares of such a size that each will enclose a single dot and also enclosing fainter lines which form smaller squares or other figures whereby the dots may be classified at sight according to the number of these smaller squares or the like which a given dot covers.

There is first made a reproduction of the picture to be transmitted to a scale sufficiently enlarged to enable the dots 1 (fig. 1) to be readily classified at a glance according to their size. To facilitate this classification there is superposed on the picture two series of lines 2 at right angles to each other so spaced that the squares thereby produced shall each contain one of the dots 1 constituting the picture. Lines 3 more closely spaced than lines 2 may be also faintly printed so as to produce a large number of squares within each of the larger squares, or instead of employing faintly marked squares we may place within the squares formed by the lines 2 concentric circles as indicated at 4 or a series of squares of uniformly increasing size as indicated at 5, or any other form of faint ruling which may be found convenient may be employed. By this means it is possible for an operator with a small amount of training readily to recognise the dots according to their size by observing the number of the faintly marked squares or the like which are covered by a given dot. The dots employed in forming the picture will be of a certain number, say ten, specific sizes, and on recognising that a certain dot belongs to one of these sizes the



operator would transmit a predetermined signal corresponding to the given size of dot. This signal may be received by any suitable form of mechanical receiver but modified, so that instead of printing letters, numerals or like characters, it will print a dot corresponding in size to that on the original picture. A series of signals may thus be sent, received, and the appropriate dots printed corresponding to the dots in one of the rows contained in the original picture. A second row of dots is then transmitted, and so on until the complete picture has been built up at the receiving end. This is then photographed and a process block prepared for reproduction of the required number of copies in the well-known manner.

The enlargement required for the transmission of the picture may be produced in any suitable manner, such for example, as by means of photography. For the sake of rapidity, however, it is preferred to employ an optical projection method whereby the picture is projected on a screen on an enlarged scale by an ordinary projection lantern, the squares containing the dots and fainter squares or other figures being also projected on the screen or printed thereon.

Automatic transmission of the signals may be attained by making an enlarged process block of the original picture, and utilising the raised dots thereon as electric contacts whereby signals corresponding to the various sizes of dots may be transmitted automatically, thus dispensing with the necessity of an operator at the transmitting end to recognise the various sizes of dots occurring in sequence and then transmit corresponding signals. Such a method of automatic transmission is diagrammatically illustrated in the specification.—John Cameron Grant, Holly Lodge, The Terrace, Barnes, Surrey.

The following complete specifications are open to public inspection before acceptance.

ARTIFICIAL LIGHTING.—No. 179,901. Artificial lighting devices for photography and the like. F. Demoulin.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, JUNE 5.

Bournemouth C.C. Outing—Whole Day at Picket Post and Burley.
Edge Hill C.C. Outing—Eastham, Carlet Park and Raby Mere.

TUESDAY, JUNE 6.

Bournemouth Camera Club. Hints, Dodges and Gadgets.
Sheffield Phot. Soc. Annual Meeting.

WEDNESDAY, JUNE 7.

Dennistoun Amateur P.A. Suggestions for Winter Syllabus.
Edinburgh Phot Soc. Annual Meeting.
Hackney Phot. Soc. Outing to Isleworth.
Rochdale Amateur P.S. "Self-Toning Paper." W. Lord.

THURSDAY, JUNE 8.

Hammersmith Hampshire House P.S. "Pictorial Photography in Practice." G. C. Weston.
Optical Society. Joint Conference between Ophthalmologists and Opticians on Spectacle Construction.
Sheffield P.S. Outing—Coal Aston to Hazelboro'.

SATURDAY, JUNE 10.

Bradford Phot. Soc. Outing to Fulneck.
City of London and Cripplegate P.S. Outing to St. Albans.
Dennistoun Amateur P.A. Outing to Wishaw.
Exeter Camera Club. Outing to Mamhead Park.
Hackney Phot. Soc. Outing—Zoological Gardens.
Hammersmith Hampshire House Phot. Soc. Outing—Hammersmith to Richmond.
Partick Camera Club. Outing to Whistlefield, Loch Long.
Rochdale A.P.S. Ramble with L. and C. Union.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, May 30, Mr. Furley Lewis in the chair.

The chairman declared open the the house exhibition of portraits by Mr. Pirie Macdonald, of New York.

Mr. E. J. Bedford delivered a lantern lecture on "Wild Flowers," illustrated with a large number of lantern slides, and many excellent examples of the lecturer's work in the Autochrome process. Mr. Bedford is a true lover and student of Nature, and his discourse was full of interest on account of his close observations of the wild flowers of the countryside.

A most hearty vote of thanks was accorded to the lecturer by acclamation.

CROYDON CAMERA CLUB.

Nothing draws so well at Croydon as the technical, and last week, despite the sweltering heat, a goodly number of members assembled to hear that past-master in camera design and construction, Mr. A. S. Newman, lecture on "The Evolution of the Hand-Camera."

This, he said, was primarily bound up with the introduction of the dry-plate. In those days cameras capable of being worked in the hand were invariably designated "detective," with the idea they would mostly be used for taking people unawares. Accordingly they took outward forms simulating, among other things, paper parcels tied with string, attaché cases, books, and even Bibles for use in church. The newspapers wildly stunted this new rôle in photography, and even Scotland Yard became imbued with the same idea.

Next, some foreigners went to the other extreme by introducing flamboyant hand-cameras designed to attract the attention of the multitude, and impress it with the importance of the operator exercising mysterious functions.

At this juncture in photographic history two classes of exposures only were known, one sort being time exposures with field and studio cameras, the other being "shutter" exposures with the detective type. No curiosity was exhibited or felt regarding the actual duration of these shutter exposures, beyond the fact that a shutter was considered the best which worked the fastest. Gross under-exposure was the order of the day. Naturally the subject attracted considerable attention among amateurs, and rarely did an evening pass at a photographic society without the production of the latest home-made and commercial shutters.

Apart from such primitive designs as the "drop-shutter," one of the earliest was the roller-blind due to B. J. Edwards and also to Mr. Cadett. The exceedingly stiff blind material, compulsorily used for lack of a better, sometimes refused to move at all in cold weather, and speeds always varied largely with changes of temperature. Kershaw's and Thornton Pickard's roller-blind shuttera followed. Contemporaneous were a whole series of mechanical instruments of varied design.

Grimstone's (the first to work between the components of the lens) started the lecturer on making shutters. His "Boiler" shutter, with speeds from 1 sec. to 1/100th sec., was the first to utilise pneumatic regulation dependent upon a variable air leak. This saw the light about 1884, and was followed by the Kodak "Barker," a pneumatic shutter dependent upon variable length of stroke, familiar to all in the "Unicum," and later models working on the same principle.

The introduction of the iris diaphragm gave further impetus to the use of hand-cameras, and a vigorous push was again imported when the anastigmat lens came on the scene. The first to appear was the Zeiss, series III A, working at f/6. It was of very unsymmetrical construction, which largely accounted for the complete absence of flare, even when dazzling sunlight entered the lens. Those fond of working dead against the light would find such a lens very useful, and although its manufacture had long since been discontinued, it might occasionally be picked up second-hand. He well remembered some lantern slides being shown at the Photographic Club in the Anderton Hotel days, the original negatives having been secured with one of these lenses and at the full aperture of f/6. Not a single soul in the room believed a statement made by the lecturer to this effect, owing to the exquisite definition shown from the centre to the corners, and after he had left all agreed he was the most magnificent liar that had ever appeared in the club rooms.

Mr. Newman then dealt with the evolution of hand-cameras as a whole, and pointed out that starting of medium size, they, in the course of years, grew larger and larger till some attained the proportions of a small portmanteau. Recently things had swung the other way in sympathy with a luxurious age. Too far, in fact, to which he attributed the deterioration of photography among the amateur rank and file. On the other hand, he did not wish to indulge in wholesale condemnation of pocket cameraa (being responsible for some himself), but less flimsy apparatus, something which one could hold firmly, undoubtedly conduced to better work.

The first box camera, he remembered, was due to Mr. J. B. B Wellington. It consisted merely of a cased ordinary camera with added fitments. Notable among early cameras was Fallowfield's "Facile." It produced excellent results, mainly owing to a simple shutter permitting only of moderate speeds. The first sheath camera owed its origin to Parfitt and Human, and was the pioneer of the magazine type with falling plates. Van Neck's reflex, Shew's folding cameras, cameras by Wellington, and many others designed on sane lines were then described by means of diagrams, including the first bag-changer due to the lecturer. A good word was also put in for the twin-lens camera, provided very close objects were avoided.

The first Eastman roll-holder, he said, was a splendid piece of mechanism. The first Kodak took a long length of film, and afforded a large number of circular pictures without reloading. A curiosity of this camera was that the lens was fitted right inside the shutter, not the shutter fitted to the lens, as is customary. Day light-loading came later. More modern cameras were then briefly discussed.

Much amusement was caused by the lecturer's frequent allusion to an individual who we may refer to as "Augustus," which was not his name. Mr. Newman said he had taken out many patents over many years, and soon after sealing Augustus was pretty sure to turn up. He was quite a nice and urbane individual, who sympathetically recognised the many difficulties and tribulations inventors experienced. Deplorable, therefore, was the fact that the latest patent invariably infringed one of earlier date held by the called It, say, Mr. Newman had been granted protection for a bag changer, then of a surety dear Augustus held a patent for a nose bag, a master one, covering every form and description of bag. Still he would not be hard, or insist on his rights, and everything could be arranged to the satisfaction of all merely by the payment of royalties. Sad for Augustus, he never touched Mr. Newman for a penny, but succeeded better elsewhere. Augustus is now no more and possibly is drawing commissions from departed photographers for powerful influence exercised in securing their admission to the best circles in their new sphere.

The discussion was brief, for the hour was late. Mr. E. A. Sa said in the past he had been struck with a critical point which often existed in pneumatically controlled between-lens shutters

[illegible] With the index set to 1/20th second, or thereabouts, speeds might vary 50 per cent. or more without apparent cause. Even with sector shutters, which did not act in this way, frequently a fractional movement of the index about this critical point resulted in a large variation in speed. A modern gear-controlled shutter in his possession also showed the same tendency.

Mr. J. A. Sinclair said thousands of such shutters had passed through his hands, and he agreed with the last speaker's remarks. On the general question of speed marking it was unfortunate that the top speed of the early "Unicum" was marked "1/100th sec." instead of 1/35th of a second, which was about its actual speed. Not to lose by comparison, many makers of later and faster shutters had been tempted to follow the bad example. A most hearty vote of thanks was accorded Mr. Newman for a very interesting and instructive lecture capitally delivered.

On a recent occasion a well-attended afternoon excursion of the Croydon Camera Club was held at picturesque Limpsfield. For the first time in history ladies participated, with one exception the wives of members, whose behaviour compared favourably with a small minority who had left their wives at home. In the most kindly protective way these temporary grass widowers entertained the only young single lady in the company. One or two diffident, but envious, bachelors present eventually, realising the hopelessness of their position turned in despair to taking inanimate, and far less attractive, pictures. Apart from this, the organiser, Mr. Walker, has plume himself on a very enjoyable afternoon, and on fully maintaining his supremacy in photographic disasters by leaving his camera in the tram on the forward journey. It has since been recovered, and he is accordingly several unspoilt plates to the good.

LANCASHIRE SOCIETY OF MASTER PHOTOGRAPHERS.

The fourth annual general meeting and conference were held at the Palatine Hotel, Blackpool, on May 17 and 18.

At the annual general meeting there was a good attendance of members, Mr. Arthur Winter (President) in the chair. The Secretary (Mr. W. H. Huish) submitted his report, and in doing so stated that in consequence of the last annual meeting not being held at the proper time, through labour troubles, the current year only commenced from October, therefore his report only covered a period of eight months.

The Committee during the short period they had been in office had dealt with several matters of importance to the members, and a number of applications for membership to the Society had been dealt with. He appealed to the members to continue to support the Committee in their effort to make the general meetings of the Society both interesting and profitable. He thanked them for the support they had given him as Secretary during his year of office, and hoped that they would extend the same support to his successor.

The President stated that he had received a communication from Mrs. W. T. Carter that her husband, Mr. W. T. Carter, the hon. treasurer, had been taken ill that morning and was unable to travel to Blackpool in order to submit the statement and balance-sheet. Mrs. Carter, however, had brought along the books and the hon. treasurer's statement, and he asked the members to be satisfied with the reading of the treasurer's statement and to postpone the passing of the balance-sheet until the next general meeting. The members agreed to this being done, and the statement was read and showed a credit balance of over £40.

The President then addressed the members at some length, and reviewed the work of the Society since he had been elected to that position. He stated that he had been pressed to continue in office for another year, but in consequence of pressure of business, brought about by the Preston Guild and illness in his family, he had reluctantly compelled to decide not to continue another year. He felt very strongly that the Society needed a president at the present moment who could devote a great deal of time to the work of the organisation, and he would ask the members to adopt the recommendation that had been sent forward by the committee, and that was that the vice-president (Mr. Charles Howell) should succeed him as president. At the conclusion of the President's address, Mr. Fred Read, in a few very well-chosen words, proposed that Mr. Charles Howell be elected president. This proposition was seconded by Mr. Bamber, and carried unanimously. There being no further nominations, Mr. Charles Howell was duly elected [illegible] and placed in the chair by Mr. Arthur Winter.

Mr. Charles Howell, in thanking the [illegible] for the [illegible] they had done him by [illegible] him to [illegible] at he would at all times take a deep interest [illegible] Society and promised to do his best to [illegible] his worthy predecessor. [illegible] then asked [illegible] president, Mr. [illegible] Rochdale, [illegible] Mr. R. [illegible] be [illegible] adopt [illegible] unanimously.

The President [illegible] Mr. [illegible] carried to [illegible] for [illegible] Winter proposed [illegible] was seconded by Mr. Read and carried [illegible] tion of [illegible] by [illegible] the secretary [illegible] elected on the committee of management [illegible] (Barrow), [illegible] (Rochdale), W. [illegible] W. Herbert [illegible] Caro (Eccles), [illegible] (Wigan), Percy Guttenberg (Manchester), Do[illegible] A. Walmsley ([illegible]ton), [illegible] (Blackpool).

At the conclusion of the election of officers, a long discussion took place on the question of the proposed [illegible] been postponed, and the President called upon Mr. [illegible] to give his report with regard to the matter. At the conclusion of that report, Mr. Bamber promised £100 towards the guarantee fund, so that the exhibition [illegible] held next autumn, and made several very valuable suggestions with regard to it. Mr. Feloy proposed that the exhibition be held under the auspices of the Society. This proposition was seconded by Mr. Caro and carried unanimously. Mr. [illegible] then proposed that Mr. Bamber's kind offer be accepted, and that Mr. Bamber be on the committee of management, and the details of organisation be left to this committee. This proposition was seconded by Mr. Winter and carried.

At 4.30 p.m. a lecture by Mr. C. Pollard Crowther, F.R.P.S., on the "Psychology of the Studio" was given. The President, on introducing Mr. Crowther to the members, said that they were indebted to the [illegible] for having allowed him to visit Blackpool in order to give them the value of his wide experience. Mr. Crowther's lecture was both interesting and instructive, and the happy manner in which he dealt with his subject appealed to those present. At the conclusion of the lecture, which lasted one hour and which was illustrated with some very good slides, Mr. Crowther was thanked by the President, on behalf of the members, and those present showed their appreciation in a true Lancashire style.

At 7 p.m. the annual dinner was held, when the guest of the evening was Mr. A. Swan Watson, the President of the P.P.A. He was supported by the Secretary, Mr. Alfred Ellis. At the conclusion of a most excellent dinner and the Royal toasts, Mr. N. S. Kay, [illegible] President, made a very happy speech in submitting the toast of "Our Guests." It was, he said, the first occasion on which the Society had been honoured with the presence of a president of the P.P.A. at their annual function, and he expressed a wish that it would be the means of cementing the friendship which already existed between the two organisations. Mr. Kay also touched upon the Congress to be held in London in the autumn, and hoped that every member of this Society who could do so would attend that conference.

Mr. A. Swan Watson, in responding to the toast, amused the company with some very good Scotch anecdotes. He stated that he appreciated the honour that had been done him by inviting him to that function, and he endorsed the sentiment that had been expressed by Mr. N. S. Kay with regard to the two organisations. He was greatly in favour of the holding of these conferences, and he had some very happy recollections of the conferences that he had attended of the P.P.A. in the years gone by. He wished the Society of Master Photographers every success, and hoped that as many as possible of them would journey to London for the Congress, so that they might [illegible].

Mr. Arthur Winter [illegible] the toast of the President, Mr. Charles Howell, [illegible] Mr. Howell [illegible] himself in the work [illegible] Mr. Howell had many [illegible] as far away as Chatham [illegible] he was not present [illegible] his year of office.

and asked the members to support their new president in the same way that they had supported him.

Mr. Howell, in responding, stated that he did not pose as a public speaker, but he would do his best as a worker to fill the position they had been good enough to place him in as their president. He invited the co-operation of all the members in the work of the Society, and he would impress upon them the necessity of letting him or the secretary know of any grievance they might feel they had, as both he and his committee were desirous of the co-operation and assistance of every individual member, and if they had any suggestions to make he would be very pleased if they would send them along.

The toast of the British Photographic Manufacturers' Association, Ltd., was proposed by Mr. W. H. Huish. In proposing this toast, Mr. Huish regretted that none of the officials of the Association were present to respond. A number of the firms connected with the Association had received circulars with regard to the function, and it was the intention of several to be present, but, unfortunately, at the last moment they were prevented from doing so. Several of the manufacturers' representatives, however, were present at the dinner that night, and he welcomed them on behalf of the Society. In doing so he suggested that if the two sections of the trade could only see their way to set up a joint committee in order to deal with matters affecting the industry, he thought it would be to the mutual advantage of all concerned. He sincerely hoped that if the committee of the Society decided to organise an exhibition for next autumn the support of the British Photographic Manufacturers' Association would be given to that exhibition.

Mr. V. L. Wahltuck (A.P.M., Ltd.) was called upon to respond, and in doing so stated that he was surprised to hear from Mr. Huish that so few had replied with regard to this function. He felt sure that had they received personal invitations instead of a circular letter the Manufacturers' Association would have been well represented. He differed from Mr. Huish in some of the opinions he had expressed; at the same time he appreciated the honour they had done him by inviting him to that function, and he sincerely hoped that in the near future Mr. Huish's suggestion of co-operation between the two sections of the trade would be brought about.

In the absence of Mr. W. T. Carter, the toast of "The Ladies" was proposed by Mr. R. H. Gresswell, and was responded to by Miss Flemming, F.R.P.S.

"The Society of Master Photographers" was proposed by Mr. Alfred Ellis, Secretary of the P.P.A. He stated that it gave him very great pleasure indeed to be there that evening as a past-president of the P.P.A. and its present secretary. He had for many years been associated with the Association; as a matter of fact he was the first secretary, and he had at all times looked upon the setting up of these local Associations with favour. He was glad to see that the Society of Master Photographers had been so successful, and he hoped that in the future the good feeling that had prevailed in the past between the two organisations would continue. He touched upon some very interesting past history of the P.P.A., and invited the co-operation of all photographers in order to make the Congress which will be held in London in September next a success.

The toast was received with enthusiasm by the visitors, and the President, Mr Charles Howell, suitably responded.

During the evening a very excellent programme of music was provided by Mr. Chris. Howell, son of the president, and each musical item was very much appreciated. Mr. W. H. Huish, secretary, acted as toast-master.

On the following day at 3.30 Miss Flemming, F.R.P.S. (of Nottingham) gave a very excellent paper on "Child Photography," illustrated with some very excellent lantern slides.

At 6.30 a demonstration was given by Mr. C. Pollard Crowther, F.R.P.S., on the "Making of Portraits." Mr. Crowther had already made a very excellent impression on the members, and although this was the last function of the Conference, a very large number remained over in Blackpool in order to hear Mr. Crowther once more. At the conclusion of the demonstration the president thanked Mr. Crowther and all those who had assisted in making the Conference such a great success, and he sincerely hoped in the near future they would all meet once more and have just as good and profitable a time as they had had during those past two days.

News and Notes.

SAURIAN MOUNTING PAPER.—A reader wishes to know the firm supplying a stiff art mounting paper, made in two shades, and supplied under the name of "Saurian." Replies, addressed to D. M. F., c/o the Editors, will be forwarded.

THE CLUB PHOTOGRAPHER.—Members of the Borough Polytechnic Photographic Society contribute the staple contents of the June issue of our little contemporary. One paper describes the use of a card index system in the management of a photographic society.

HOUGHTONS PROFESSIONAL BULLETIN for May publishes an article on the Photographic Fair and on the American professional portraits by Alexander Mackie. The issue also contains illustrated particulars and prices of Messrs. Houghtons' equipment for D. & P. work.

THE "ROYAL MAGAZINE," published by C. Arthur Pearson, Ltd., may be brought to the notice of their customers by photographers just now, since it is offering £50 for the photograph of the prettiest feminine reader. £5 will be awarded to the photographer who takes the prize-winning photograph. Particulars of the competition, which closes on June 22, are given in the June "Royal," just published.

CRITERION FILM COMPETITION.—In addition to their monthly contest, Messrs. Criterion, Ltd., have organised a competition for prints from negatives on Criterion roll-film, in which prizes of £15, £10 and £5 will be awarded to amateurs. In addition, the dealer supplying the spool which gains the first prize will receive stock of Criterion manufactures to the value of £10. The competition closes on September 1. Entries should be addressed to Criterion, Limited, Stechford, Birmingham, and should be marked "Film."

A FRENCH DICTIONARY OF PHOTOGRAPHIC CHEMICALS.—A correspondent, writing in reference to the reply given to "R. G." in "Answers to Correspondents" last week, says: "As French is easier for the average Englishman to read than German, your correspondent may be interested to know of a small paper-covered dictionary published by Charles Mendel, Rue d'Assas, Paris. The title of the work is 'Les Produits Chimiques Purs en Photographie: Leur Nécessité; Leur emploi; Leur contrôle.' The author is Dr. Camille Poulenc, but the price is not stated."

MARSHALL ENLARGEMENTS.—Messrs. Marshall & Co., Mansfield Road, Nottingham, whose trade work for photographers we have often been able to commend, send us a copy of the illustrated catalogue, which they have just issued, showing the styles of enlargement which they offer. Prices have been considerably reduced, remarkable value being offered in monochrome and coloured enlargements. Messrs. Marshall undertake all descriptions of trade work including copying, contact printing, and miniatures, and have recently added a department for the trade development of amateurs' film negatives. The list is obtainable free by bona-fide photographers and dealers on application.

THE PHOTOGRAPHIC CONVENTION.—The thirty-second meeting of the Photographic Convention is to be held at Shrewsbury, from July 3 to 8, under the presidency of Mr. C. B. Clifton, supported by Mr. C. H. Bothamley, retiring president. A full programme of excursions has been arranged, including visits to the picturesque towns of Ludlow and Much Wenlock. During the week Mr. W. L. F. Wastell will deliver his lecture, "A Loon in London," and there will also be a lecture on "Old Shrewsbury." The Shropshire Photographic Society, newly formed under the presidency of Mr. Martin J. Harding, is lending generous help in the arrangements for the week. Mr. C. J. Poole, of 51, Hill Crescent, London Road, Shrewsbury, is the secretary of the local committee. It is hoped that a large gathering will assemble at Shrewsbury and make the week a repetition of the pleasant functions of former years. Applications for membership and requests for further particulars should be addressed to the general secretary, Mr. F. J. Mortimer, 56, Leigham Court Road, Streatham, London, S.W.16.

A NORTHERN PROFESSIONAL PHOTOGRAPHERS' SOCIETY.—At a meeting of the professional photographers of Middlesbrough and the surrounding towns, held last week, in the Scottish Café, Middlesbrough, it was decided, upon the motion of Mr. Harold Hood, of Middlesbrough, seconded by Mr. Greenwood, of Stockton, to form the North Yorkshire and South Durham Professional Photographers' Society to further the interests of the professional photo-

graphers in the district. Mr. Heldsworth, of Hartlepool, was elected chairman; Mr. H. Hood, vice-chairman and treasurer; Mr. Ball, jun., Stockton, secretary; and Messrs. Parry, Greenwood, Bunting, Richardson, Wood and Davy a committee. Rules were also approved and other details settled. Although the meeting was full of enthusiasm, it was decided to call an adjourned meeting, and the Secretary was instructed to make special efforts to secure the largest possible attendance so that the rules and general procedure might have the approbation and confirmation of as many professional photographers in the district as possible. At the adjourned meeting the actual details of a minimum price scale for technical and other work are to be fully discussed.

A Press Photographer's Problem.—Writing to the editor of "The Journalist" (the organ of the National Union of Journalists), a correspondent, using the nom-de-plume of "Picture Maker," says: "I gather that the Leeds Branch is to consider the question of a staff photographer supplying London papers with photographs, it is believed, at the request of his editor, 'a local free-lance being willing.' Providing that the staff photographer is allowed a reasonable commission on sales is there anything unfair in this arrangement? In some districts it has obtained for years. When negatives are taken for an employer by a salaried man, the right to dispose of them in any way he thinks fit is clearly vested in the employer. There is no legal obligation even to pay commission. A 'free-lance' man can hardly have ground for complaint if he takes his pictures simultaneously with the salaried man and promptly dispatches his negatives to an agency. He will be 'in first' easily. It would be objectionable for an employer to offer negatives at less than the current price for pictures, of course. If the salaried man's negatives are of subjects which the 'free-lance' man has not covered there is no grievance whatever that I can see."

Mr. F. A. Free, of Davenport, Iowa, to whom the award of the silver cup was made in the recent exhibition of American portraiture at the Photographic Fair, has written to Mr. Arthur C. Brookes a letter which we are glad to quote, particularly on account of the community of spirit between photographers in the country and the United States which it exhibits. Mr. Free writes:—"I received your letter yesterday, and wish to say that I appreciate the honour more than I can say, so much more on account of the fact that I had forgotten that there was a cup offered. I sent my pictures because I believe in an exchange of pictures and ideas internationally, and especially among English-speaking nations, and I sent mine mainly to help give a good general idea of American professional pictorial photography.

"Our national Association was in session at Kansas City when your cablegram was forwarded to me, and many of the exhibitors were there, and when my winning the prize was announced, they gave me a great ovation. They thought it quite the biggest honour ever received by an American photographer. I have received numerous medals and certificates on my work in the past, and none can compare with the advertising value and standing that the winning of this cup will give me in the profession.

"I will be anxious to receive this cup, which you say will be shipped immediately following the Fair. I wrote Mr. William Crooke telling him of my appreciation, and some day I expect to be over there to see what our English cousins are doing."

Correspondence.

*** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** We do not undertake responsibility for the opinions expressed by our correspondents.*

BLUE SCREENS IN COPYING STAINED PRINTS.

To the Editors.

Gentlemen,—With reference to your answer to "J. H."—paragraph three in this week's "Answers to Correspondents"—the following may be of interest. Some years ago an old P.O.P. print was brought to me to be copied, the whites of which had turned a decided yellow; furthermore, there was an ink stain on the dark (purple) part of the print, which would not yield to ordinary treatment. A negative on an ordinary plate gave a very poor result, the ink stain showing very prominently. At that time I was experimenting in the making of colour screens for three-colour work, and had two or three blue screens by me, one of which I selected, and, again using an ordinary plate, made a second negative. The result was that the whites were fully restored, a somewhat expected result, but I was rather surprised to find that no trace of the ink stain appeared in the second negative.

I have frequently used blue screens for copying stained and spotted prints with very satisfactory results. In this respect I have found that correct screens for colour work are not always successful, different stains requiring different screens to entirely eliminate them.

May I give one other instance? A print that appeared to be quite perfect was brought to me for advice. A copy was particularly desired, but two or three attempts to obtain one had proved unsatisfactory. At each attempt numerous clear spots had appeared in the copy negative all over the white portions of the subject. Examination in good daylight showed that the print was covered with faint yellow spots. Copying through a blue screen cut these spots out entirely.——Yours faithfully,

Cyril Venning.

Brook St. Hill, Brentwood, Essex.
May 27

THE RUSSELL EFFECT.

To the Editors.

Gentlemen,—The Paris notes of your esteemed French correspondent, M. L. P. Clerc, in your issue of May 19, 1922, contain mention of a "New example of the Russell effect," by M. Bardier. This refers to lignite and jet. An account of the action of these substances on the photographic plate appears in the two following papers by Russell:—

"The action of wood on a photographic plate in the dark," Trans. Royal Society, Series B, Vol. 197, p. 285. "The action of resin and allied bodies on a photographic plate in the dark," Proc. Royal Society, B, Vol. 80, p. 384.—Sincerely yours, Olaf Bloch.

Ilford, Ltd., Ilford, London.
May 24.

DO ACID FIXING BATHS CAUSE BLISTERS?

To the Editors.

Gentlemen,—An experience I had during the heat wave of last week leads me to ask the above question. Last Tuesday (May 23) was the hottest May day we have had for generations—in London at any rate. Having many plates to develop I thought it advisable to take extra precautions against frilling, and frilling I did stop right enough, but in place of frilling I got blisters.

For many years I have been in the habit of using the acid-alum-sulphite fixer and hardener, as given on page 454 of the current "Almanac," namely: Soda sulphite, 4 oz.; glacial acetic acid, 3 oz.; alum, 4 oz., and water to 20 oz. This is kept as a stock solution, 2 oz. of it being added to each 20 oz. of the normal hypo solution. This solution has been a good servant for many years, but last Tuesday, when the darkroom and solutions were so very hot, I decided to use 4 oz. of the stock acid bath to one pint of normal fixer—double strength. I ought not to have doubted the efficacy of the normal strength, but I did, and after the negatives had been in the bath for about five minutes some thousands of pimples and blisters appeared on the gelatine surface of many of the plates. Two makes of plates were developed and fixed, but the defect appeared only on one make, the extra dose of acid-alum solution apparently not suiting them. I say "extra dose," because some further exposures on the plate fixed in a normal bath showed no defects, hence the putting of the blame upon the extra strong acid-fixer.

You may be able to suggest some other cause of the annoying defect—the negatives are quite ruined—having perhaps some experience of it? Should you think as I do that the excess of acid and alum caused the blisters, it would be wise to caution your readers concerning the following of instructions, pointing out the danger of increasing the strength of certain fixing and hardening baths.

Many years ago, when using formaldehyde as a hardener, I once used it too strong, the films stripping like pieces of horn from the plates after drying, but I never expected an acid-fixer and hardener to cause blisters.

The blistered plates, it may be mentioned, were developed in a normal hydroquinone-metol solution.—Yours faithfully,

C. L. KESTLETON.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

S J.—The secretary of the Photographic Dealers' Association is Mr. E. H. Ayling, Messrs. Horne's Camera Mart, New Broad Street, London, E.C.2.

M. M.—So far as we know, cases of the kind in which Daguerreotypes were mounted are not now made, but we have no doubt that a firm of makers of miniature cases, such as Messrs. G. and E. Russell, 262, Northfield Road, King's Norton, Birmingham, could make imitations of them

B. R.—The by-laws respecting photography on the foreshore vary in different places, but, as a rule, the rights are sold each year by the corporation or local authority, and we think the latter would have the power of preventing photographs being made on the beach for money by anyone, whether by appointment or otherwise.

G. C.—Metol in combination with pyro is more prone to give stain in the negatives than any other mixed developer. If you must choose this combination, we suggest that you take an ordinary pyro-metol formula, dissolving the chemicals in three or four times the quantity of water, and use, say, two or three times the amount of sulphite. But for general purposes the pyro developer, as directed in the Houghton catalogue "Trade Developing," is the best for amateur films.

W. R.—The arrangement you suggest will work quite well, although the exposures will have to be much longer than if a condenser were used. In your case we think you would find it better to have two lamps of 1,500 c.p., placing one at each side of the opening with the reflector parallel with the negative holder. This will give more even illumination and probably shorten the exposure. It is desirable to use a rapid flat field lens when working by reflected light.

M. D.—Provided the tank is well rinsed after the use of the fixer it can be used again for the developer without any ill effects. We don't think that coating it with anything is really necessary as a protection against the acid hypo solution, provided that the solution remains in the tank only for such comparatively short periods as the tank is in use. But considering, as we imagine, that you will often be working when there is not a plentiful water supply, we think you would be well advised to take a separate tank for fixing.

H. S.—We have referred your question to Mr. Ermen, who replies as follows, and adds that pure amidophenol and amidocresol are supplied by the British Dyestuffs Corporation, even in the smallest quantities. The free base of metol is quite freely soluble in water, and if the solution is at all warm, is liable to separate, on the addition of alkali, in the form of transparent oily drops, instead of as a crystalline, white, flocculent precipitate, as do amidophenol and amidocresol. It is thus not at all easy to know when to stop the addition of caustic soda, and one is very liable to overstep the mark. Furthermore, in the rodinal type of developer, metol is in no way superior to amidophenol, and not as active as amidocresol, whilst it is considerably more expensive

H P.—A matt surfaced bromide print requires no preparation for colouring if it has not been handled with greasy fingers. You were quite wrong to put French chalk on the surface, as this is repellant of water. Gum is not necessary, except to match the surface of glossy paper or to give depth to the shadows of a matt print; it is rarely used now. If a print is greasy, it may be washed over with a little diluted ox-gall, or even a little soapy water, which should be well wiped off with cotton wool. Newman's sizing preparation makes the colour work very sweetly on almost any paper. You can get it from Newman and Co., artists' colourmen, 24, Soho Square, London, W.1. So far as we know, there is no book now to be had on the subject. Winsor and Newton used to publish a shilling manual on colouring photography, by Rintoul, but it has long been out of print.

L. J. B.—The scummy appearance on the negatives is due to the use of the alum bath and is rather apt to occur in hot weather here, although plates have been remarkably free from liability to show this defect for many years past. Moreover, owing to the superior emulsions, the alum bath is now very little used. We think you will have to try to dispense with alum if you possibly can; that is to say, if the defect is frequent. Instead you could use a bath of about one part of formaline in 20 parts of water before development, or between development and fixing. The Ilford Tropical hardener, sold by Johnson and Sons, 23, Cross Street, Finsbury, London, E.C.2, is a very good means of avoiding softening of the gelatine in tropical climates, and in our experience is without tendency to produce these scummy markings. We are sure that if you discontinue the use of alum you will not be troubled with them further.

P. H.—You certainly ought to wash the films reasonably well, otherwise, so it seems to us, you are only making trouble for yourself in undertaking this work. Surely it is not impossible to fit up a tank about 1 ft. square, and say 4 ft. in depth, in which half a dozen film bands can be suspended at a time and washed in a current of water? Half an hour's washing in this way should be satisfactory If you use an ordinary large domestic bath, films would never get a complete change of water, but we daresay the great bulk of the hypo would be removed from them, say, half an hour's soaking. The residue could no doubt be removed completely and without harm by passing the film bands through a weak solution of potass permanganate. You should use a solution rendered just pink by adding a few drops of permanganate solution to plenty of water, adding more of the stock solution as the colour is discharged by the hypo in the films. In any case, the solution in which the film bands are thus treated should be frequently renewed in order to avoid the tendency for the permanganate to produce brown stains, or a general brown stain. A weak solution of sodium bisulphite will clear off any such stain

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. **ESTABLISHED 1854.** **PRICE FOURPENCE.**

TERMS OF SUBSCRIPTION POST FREE.

UNITED KINGDOM OR CANADA.—*One Year*, £1 1s. 8d.; *Six Months*, 10s. 10d.; *Three Months*, 5s. 5d.

ANY OTHER PART OF THE WORLD.	*One Year*	£1 3s. 10d.
	Six Months ...	12s. 0d.
	Three Months	6s. 0d.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibits the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

HENRY GREENWOOD & Co., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3240. Vol. LXIX. FRIDAY, JUNE 9, 1922. Price Fourpence.

Contents.

SUMMARY

Many hints and suggestions in the photography of children are contained in a paper read by Miss Flemming, F.R.P.S., of the Freckleton Studio, Nottingham, at the recent Blackpool Congress of the Lancashire Society of Master Photographers. (P. 337.)

The final chapter of the series by "Pelham Swinton" on the business side of professional photography concerns itself with the practical and persuasive (or legal) methods to be taken in the collection of outstanding accounts. (P. 335.)

An example of the opportunities for professional cinematography is the subject of a paragraph describing a film taken recently by Miss Olive Edis of a notable wedding. (P. 333.)

An exhibition of remarkable interest is that of portraits by Mr Pirie Macdonald, now being held at the house of the Royal Photographic Society, 35, Russell Square, London, W.C.1. (P. 343.)

Preliminary particulars are published of the forthcoming congress of the Professional Photographers' Association. The entry form for the exhibition of portrait and commercial photography is now obtainable. (P. 333.)

Photographs of house property might be much more attractive than they usually are; whilst there is still much property changing hands, there are many opportunities for the supply of photographs which present houses in their most attractive aspects. (P. 334.)

The features of apparatus for enlarging without the use of condensers are the subject of a leading article, in which the sources of light and construction of these enlargers are dealt with. (P. 334.)

The first portion of the valuable review by Mr. F. F. Renwick of recent progress in photographic manufacture and in methods of photographic investigation and measurement will be found on page 340.

At the adjourned hearing of the Board of Trade inquiry under the Safeguarding of Industries Act, respecting the sale of German scientific goods in the United Kingdom, arguments on behalf of German firms were presented by Mr. Inskip, K.C., who called evidence by agents for German manufacturers. (P. 342.)

One or two of the points requiring to be kept in mind in the use of warm black development papers are mentioned in a paragraph on page 334.

We regret to record the death of Mr. J. Crawys Richards, one of the leaders in the early movement in pictorial photography, and author of a manual on the gum-bichromate process. (P. 346.)

The Traill-Taylor lecture is to be delivered in October next by Dr. R. S. Clay, who will take as his subject "The Development of the Photographic Lens from the Historical Point of View." (P. 346.)

EX CATHEDRA.

The P.P.A. Congress.

A preliminary circular outlines the features of the Congress to be held in the Princes Galleries, Piccadilly, London, W., from September 11 to 15 next, by which the Professional Photographers' Association will celebrate the twenty-first anniversary of its foundation. There will be an exhibition of apparatus with demonstrations by experts, lectures and demonstrations on posing, electric lighting, business methods, etc.; visits to works of photographic manufacturers and to some of the London studios. One evening of the Congress is to be set apart for assistants, whilst an announcement of much interest is that which relates to the attendance of American, Canadian and Continental photographers. Mr. Pirie Macdonald, a host in himself, has definitely promised to take part in the Congress throughout the week. An international exhibition of professional portraiture is being organised and will, it is hoped, include examples of the work of leading portraitists in all parts of the world. Representation in this exhibition is obtained by open competition, and the form of entry is now obtainable on application to Mr. Alfred Ellis, 2, Vinery Villas, Hanover Gate, London, N.W.8. The exhibition will include also a section for commercial and technical photography, and silver and bronze medals will be awarded in both sections. It is evident from the above programme that the Council of the P.P.A. are leaving no stone unturned in their efforts to make the Congress of the greatest possible value to professional photographers. Full particulars will be published shortly, but in the meantime our professional readers in all parts of the world should support the Council in the one way which is open to all of them, namely, the sending of their work to the exhibition, the last day for receiving which (together with the entry form) is August 31.

* * *

Cinematograph Portraiture.

From time to time we have pointed out the opportunities which present themselves for the employment of a cinematograph camera by photographers in the circumstances in which most of those in provincial towns are situated. Nevertheless, we have heard very little in lead of enterprise of this kind, and, therefore, we were very interested in having our notice drawn a few days ago to a piece of cinematograph work undertaken by a versatile woman photographer, Miss Olive Edis. We witnessed the showing of a film which Miss Edis took about ten days ago of the village wedding of the son of Sir Henri Deterding, the oil magnate. The ceremony took place in the little Norfolk village of Holt, where Miss Edis filmed the story in a way which unquestionably gave the film an interest which will make it a prized possession by those who were the chief actors in it. The incidents began with the home of the bride's mother, finished with the country estate of the bridegroom, and included a

number of humorous passages, incidental to the high spirits which find expression on the occasion of a marriage, and particularly of one having certain romantic features. There are scores of weddings taking place every month among people to whom the cost of acquiring a cinematograph record of the incidents is a trifling amount. Yet it may be questioned whether the thought of adding this business to that of making the stereotyped groups and other still photographs occurs even to those who actively canvass for wedding business. But they, in consequence of being on the spot beforehand, are better able to make the arrangements than is the operator who comes down in a hurry from the headquarters of a topical cinematograph firm. Miss Edis is to be congratulated on a piece of enterprise which is certainly the first of the kind which has come under our immediate notice.

* * *

Warm-Black Bromides. In the use of the warm-black grades of bromide, so popular to-day, photographers who have not been getting results of the quality they would like will do well to examine their negatives with a view to ascertaining if they have sufficient contrast to give the best results. A negative that will give a good print or enlargement upon one of the "hard" grades of bromide, and a fairly good result upon one of the ordinary rapid grades, must not be expected to give the finest result upon a warm-black paper. Probably its greatest defect will be as regards the colour of the print, which, instead of being a pleasing warm brown black, will be of a dirty black colour. One maker of these warm-black bromide papers emphasises the importance of a suitable negative, advising one of vigorous quality, such as will give a good print upon P.O.P. Those who have been disappointed with their previous results, when compared with the manufacturer's specimens, will very likely find that it is the density of their own negatives that is at fault. Another point often overlooked is that development should be carried to finality in order to get the best result as regards colour of the prints. More or less random exposure, followed by rapid development, which is the practice of many slipshod printers, will not do with warm-black bromides. If, however, a print has been over-exposed and not fully developed, and is consequently a poor colour, treatment with the chromium bleacher, followed by full re-development with amidol, will be found to work wonders.

* * *

Photographs of Houses. The individual who is engaged in the harassing task of trying to find another place of residence must come to the conclusion that, on the average, owners and would-be sellers of houses are very badly served by the photographs which they use for showing what a property is like. Undoubtedly this is largely their own fault and arises from the employment of the travelling photographer who goes about offering at a cheap rate postcard photographs of houses. These productions, of which a good many have happened recently to come under our notice, are commonplace to a degree. Little is done to show a house in its best aspect, and it is often instructive to contrast the bald appearance (in the photograph) with the often picturesque character which a house has when actually seen in its surroundings. Often, too, the photograph is taken in dull weather, so that the character of the building suffers from the lack of light and shade in the photograph. Whilst there is still so much buying and selling of houses going on, there is the opportunity for photographers to give more thought to this kind of business. An advisable preliminary is to prepare a few specimens in which sunshine plays its enhancing part in showing a house to advantage, and in which also an endeavour is made to present adequately the setting of a house when this is in fairly open surroundings. To many a prospective purchaser a picturesque glimpse of a house obtained from a point in the garden is more persuasive than the most detailed more conventional picture.

ENLARGING WITHOUT CONDENSERS.

WHILE the ordinary type of enlarging lantern with its large condensers still holds pride of place with most professional photographers, signs are not wanting that this position is being challenged by various devices for illuminating the negative in a less costly manner. Not alone the cost of the apparatus but the quality of the work produced has contributed to the development of condenserless enlargers, for it is generally acknowledged that defects in the glass or film, or the marks caused by retouching medium, are less obtrusive in the enlargements when the condenser is dispensed with.

There are two main classes into which such enlargers can be divided, one being designed for use with reflected light, while the other utilises one or more diffusing screens between the lamp and the negative. There is no new principle or discovery involved in their construction, which has only been rendered of practical value by the invention of mercury vapour and gas-filled incandescent lamps. Arc lamps have been used principally by trade enlargers, but they are too clumsy and troublesome to be used in the average dark room.

A typical model of the first class is found in the Robinson enlarger, marketed a good many years ago by Marion & Co. It consisted of a rather shallow box, having in one side a nest of carriers for various sized negatives, while on the side facing it was a whitened reflector. Between these two sides were four or more incandescent electric lamps, according to the size of the apparatus Suitable screens were arranged to prevent any direct light from reaching the lens. An ordinary front-focussing camera with lens completed the arrangements. This apparatus, although sound in principle, did not win popular favour, on account of the long exposures which were found necessary. A slight yellow stain or excessive density of a negative made the production of a print in a reasonable time practically impossible. The introduction of the half-watt lamp with its greatly superior actinic value has altered this, and enlargers of this type become of practical value. Other models of this type have curved reflectors, but although this modification may slightly reduce the exposure, there is a certain risk of uneven illumination of the negative.

The other type of enlarger has many points to recommend it, not the least being compactness and lightness. In its simplest form it is to be found in many cheap postcard studios, where one finds a simple arrangement of perforated shelves, one carrying a small portrait lens, the next the negative, one above that a sheet of ground glass, while above all is a small half-watt bulb or even an inverted incandescent gas burner. From this to the Kodak or Overton automatic focussing enlargers is a far cry, but the difference is in detail and not in principle. The new enlargers have their lamps fitted into a metallic chamber which is lined with a reflecting material, either white japan or silvered glass, and closed with one or more thicknesses of ground glass. By careful arrangement of the reflecting surfaces the illumination is rendered more equal, and the exposure reduced to a point at which it becomes comparable with that required when a condenser is used.

Another very efficient form of enlarger is that fitted

with the mercury-vapour lamp, the tube being bent into the form of the letter M or, as it is sometimes called, a gridiron. The peculiar form of the tube gives very even illumination over a large area, and for this reason these enlargers are especially suitable for trade work where negatives up to 12 × 10 or larger have to be dealt with. An interesting feature is the fact that two enlarging cameras can be worked with one mercury-vapour lamp, which is then provided with two diffusing screens and sandwiched between the negative holders.

An important characteristic of enlargers of these types is that no adjustment of the light is needed for different degrees of enlargement. This renders the automatic focussing enlargers possible, as an additional movement for this purpose would have added enormously to the difficulties of construction.

Those of a constructive turn of mind, as are the majority of photographers, will find considerable interest in the designing of enlarging apparatus on the lines described above. Where the electric current is available the use of half-watt lamps makes the task an easy one; in other cases the inverted incandescent gas burner is by no means a bad substitute. Experiments may be made with a single lamp with a many-facetted reflector (a popular method in America), or with grouped lamps in the frustrum of a pyramid the sides of which are silvered glass. There is to be had at some ironmongers an octagonal pyramidal reflector, lined with corrugated glass, which, with a single half-watt lamp and a sheet of ground glass, illuminates a half-plate negative under somewhat trying conditions.

A few hints may be given to would-be constructors. Do not use finely ground glass for diffusers; the coarser the grain the better the diffusion, provided that the nearest surface is far enough from the negative for the grain to be out of focus. See that there is sufficient ventilation in the light-chamber. Use a rapid flat-field lens, since there is no concentration of light as when using a condenser. Choose a vertical model in preference to a horizontal one; it is easier to build and also to work.

THE BUSINESS SIDE OF PROFESSIONAL PHOTOGRAPHY.

[The subject of the last of the chapters on the business side of professional photography, namely, the collection of customers' accounts, provides our contributor, "Pelham Swinton," with special opportunities for exhibition of his mordant wit and shrewd insight into human nature. Previous chapters of the series have been:—"The Economic Position of the Photographer" (April 28); "The Photographer and his Client" (May 5 and 12); "The Photographer's Clerical System" (May 19); and "The Photographer's Costing System" (May 26). We think that those who may have overlooked any of the previous papers will be grateful to us for these references.]

V. *(continued)*—THE ART OF ACCOUNT COLLECTING.

Suppose, therefore, that a certain photographer sends out his accounts every month, but that a batch of ten accounts incurred in January have reached their fifth month of rendering without having been paid. If the divided card ledger previously described is in use, these ten accounts will all conveniently be grouped together. They have each been rendered four times without response, and we shall commence with the polite presumption that each of these ten persons is careless or forgetful, and that the accounts have been innocently overlooked. We therefore render them all once more, but accompanied by the following letter:—

> "Dear Madam,—We find that the enclosed account has been permitted to fall somewhat in arrear. We know how easily such things are overlooked, and that it is necessary merely to call your attention to the fact.
>
> "Yours faithfully,"

No sane person could cavil at such a letter, yet it performs all its purpose. The sole object in the case of persons who are really only neglectful, is to awaken their attention, which has been gently lulled to sleep by the monotonous influx of statements—not only from one's own firm, but from many others also. This account may possibly be the only one accompanied by a letter; moreover, it is sealed and bears a twopenny stamp—a fact which in itself will arouse interest. The opening sentence must be fairly pointed, in order to administer the necessary pin-prick; and any slight annoyance which this might cause is carefully smoothed over by the friendly and human tone of the succeeding sentence. The whole is rounded off with the suggestion that the firm is aware that the tardiness of payment is due in no way to lack of honesty or morality, and thus appeases, and perhaps flatters the recipient.

We shall suppose that this results in five out of the ten accounts being paid. The remaining five people must be either in financial difficulties, or persons who are well practised in the art of debt evasion. One thing is certain regarding the former class, that, if a letter be written to them regarding their account, an opportunity is thus given them to reply and honestly to state the cause of the delay. If no letter be sent them, they will not feel so inclined to confide their circumstances to the firm. On the other hand, the photographer may receive letters from members of the other class also pleading monetary troubles, and accompanied by many delightfully friendly little touches. Let him beware of such letters. The writers are only rascals, and it is usually not very difficult to distinguish the genuine from the hypocritical. Nevertheless he may be mistaken, and he must apply a test.

For all who write such letters, to whichever class of debtor they belong, the great test of genuineness and honest desire to pay, is the instalment system. A special letter should be sent in reply to such people, couched in a friendly tone, stating that the firm is willing to meet them as far as is possible, and suggesting that the account be paid gradually by instalments. It should be mentioned, also, that these payments should be made each month, commencing on such-and-such a date, and that the firm is content to leave the amount of the instalment to the debtor. Then, if by the date appointed, neither payment nor a letter of explanation is forthcoming, it may safely be assumed that the excuse of poverty is not genuine, or, at least, that the debtor is not honestly enthusiastic regarding the liquidation of his debt. When a person is unable to pay his debts it is not, as a rule, because he has no money at all, but merely because he has not sufficient money wherewith to meet all his debts at once. Consequently, if such a person be honestly anxious to meet his liabilities, a small monthly sum—even a shilling—would not be beyond possibility. It may be considered better, in many cases, to specify an actual sum, rather than leave it to the choice of the debtor. But, in either circumstance this test of good faith applies.

If, however, none of these remaining five debtors has sent any form of reply to the last letter, we must prepare for them

a second epistle against the next rendering. Again we find these accounts grouped together in the card ledger, while those in the February alphabet will now be ready for the first letter. This second letter is the central pillar of the debt-collecting construction. Any letter sent previous to this is only a gentle reminder, and any letter sent subsequent to it must deal obviously with the necessity for more drastic steps. The first reminds; the last threatens; but the middle letter is the letter which reasons.

Those people who are short of ready money, and who do not lend themselves to the instalment plan, intend presumably to pay off their debts one at a time, as they find it possible. It is our object, therefore, to be one of the first of those creditors who thus receive payment, partly because we desire the money quickly, and partly because the creditor whose account is left to the last may never be paid at all. There is therefore no stronger appeal which can be made at this juncture than that aimed at the debtor's sense of fairplay. A friendly letter, but gently firm withal, pointing out the unfairness involved should the debt remain any longer unpaid, strikes a note which no person of decency can resist, and, what is important, without in any manner antagonising the recipient. It should be written in the following strain:—

"Dear Madam,—You will see by the date of the enclosed account that it is now considerably overdue. We think you will agree with us that the length of credit which you have received is a very fair one, and that we are now justified in requesting a settlement.

"We are particularly anxious to avoid those unpleasant relationships which are apt to arise between firms and their clients over such matters; and we are anxious to maintain the mutual confidence which at present exists between us.

"We therefore prefer to approach you frankly in this manner, knowing that you will appreciate the reasonableness of our request, and give it your immediate attention.

"Yours faithfully."

Here, again we have the sharp, bald reminder in the first sentence, softened by an appeal to reason in the second. The third sentence mentions the possibility of unpleasant relations, but gently points out that these will not arise unless through the persistence of the debtor. The letter concludes with an appeal to fairness and friendliness which cannot be ignored by any self-respecting person.

Let us suppose that, out of the five remaining accounts, the sending of this second letter results in three payments. There now remain two accounts to be dealt with; and these will still be found lying in their alphabet—the last two cards of January. Those remaining in the February alphabet will now receive the second letter; while those of March will be due for the first.

These two belated debtors are either in very desperate financial straits indeed, or are persons of the "hopeless" class. Before passing them on to the care of the solicitor, there is one more chance of enticing them to part with what ready money they possess toward settlement of the account, and of showing at the same time that the firm is still open to receive explanation, and willing to come to any arrangement which might meet the situation of the debtor. On the following month, therefore, he third and last letter is sent. It should run thus:—

"Dear Madam,—We are sorry that we have had no reply to our last letter regarding the enclosed account, and that this matter has not been settled under circumstances which, to us, would be much more preferable. We should still be glad to hear from you regarding this account, stating the date by which you would be willing to make payment, or explaining the cause of the delay.

"We shall be glad to hear from you within ten days' time, as, after that date, this account falls to be collected by our solicitors.

"Yours faithfully,"

In this final letter the sting is in the tail. It is the last word; and that word must be adhered to. If no reply be received by the allotted time, straight to the solicitor's office that account must go, no matter whether the debtor be peeress or peasant. This series of letters should never be embarked upon if the creditor has not the courage to pursue the matter, if necessary, to the bitter end. To threaten, and then to delay action, is the worst of follies. The photographer, after having dealt thus generously and frankly with his customer, can do no more. Courtesy has done her utmost, and justice must now be claimed. He is safe in the knowledge that any customer who will run the gauntlet of these appeals, and remain heedless, is not a person with whom it can pay him to deal, and the lawyer may do his worst.

It is this class of debtor who occasions the humour of account-collecting, and thus to some extent mitigates the trouble and expense which he creates. A business man told me not long ago of a lady who had made a number of purchases from his firm, but who afterwards showed little intention of settling her lawful debts. He had written her on several occasions, and had continued to render the account over a period of two years. At last, obtaining no response, he wrote to the lady's husband. That gentleman, a military dignitary, replied by return of post enclosing a cheque for the sum due, saying that he would never deal with that firm again, and requesting them to erase his name from their books! It does not occur to such people that there exist persons in the world with whom any firm would prefer not to deal.

A similar case is that of a lady who had owed our own firm a small account for some two or three years. We had learned from outside sources that, like the devil, she went about the world seeking what she might devour, and paying nothing for it. Consequently, after a certain time, we were obliged to score the debt off our books. One day, however, she calmly entered our reception room and left with us a photograph, which she ordered to be copied. The receptionist did not recognise her until after she had gone, and we therefore drafted a polite letter to the lady pointing out that we had not, as yet, received payment of the enclosed previous account, and mentioning that we thought it only fair that this should be settled before her new order was proceeded with. This brought no reply; and, lest she should again escape us, our solicitor sent her a note threatening legal proceedings. By return we received a cheque, accompanied by a communication which stated that the fair writer had received a most insulting letter, and instructing us to return the photograph which she had left, as she had no wish to have any further dealings with us.

It will be observed that replies from persons who are thus cornered consist of two remarks:—(1) That the recipients have been outrageously insulted. (2) That they intend to have no further dealings with the firm in question. These are, after all, the only jibes left to them, as the only resort of the handcuffed malefactor is to spit upon his captors.

In my own firm, where this system of letters is employed, it is found that, of all the debtors—and there are not many—who reach the stage requiring pressure, about one-half respond to the first appeal. One quarter reach the second letter; and those who ultimately require the attentions of the solicitor are practically negligible. This is a very marked contrast to our experience previous to the introduction of the system; and the net result is, that, while reducing the risk of offending customers to a minimum, the total of our outstanding accounts, in proportion to the turnover, has been exactly halved. This means that the other half is always in the bank, instead of in the pockets of the public; and, in days such as these, few photographers can afford to despise so convenient a source of floating capital.

In addition to these three letters, another and separate appeal may be drafted to deal only with accounts of small sums, such as a few shillings. These should be settled much earlier than the larger debts, as the clerical labour and postage occa-

sioned by their collection is so much greater in proportion to the sum involved. It is these small accounts which people will overlook and forget, and such a letter, pointing out the high cost of clerical work and postage, can easily be drawn up, asking the recipient's co-operation in this matter. This, also, has been found successful.

It is, of course, unnecessary that any of these letters be written out laboriously on each occasion. A few dozen of each should be printed on duplicating machines by firms who do such work, omitting the words "Dear Sir" or "Dear Madam." These, along with the customer's name and the date, are typed in when required, and the letter signed. It has then all the appearance of a personal letter, but involving only a few seconds to write.

It is not suggested that the exact letters reproduced here should be used; in fact, the more personal the form the better, and each photographer must modify the phraseology to suit his particular class or type of client. The main rules which must be adhered to are that of patience and courtesy. The slightest deviation from these merely defeats the creditor's object, which is to collect his money without loss of goodwill. I once saw a collection-letter of a large drapery and furnishing store. It commenced thus:—

"Dear Madam,—We wish to point out that the time elapsing between the receipt and the payment of goods cannot be extended indefinitely . . ." and the letter proceeded to point out the heavy expenses which the firm was obliged to meet each month.

Now, this opening sentence is merely rude. It is not even cleverly rude. The only feeling which such a remark could excite is that of anger, and anger is the last psychological state in which a man or woman will be tempted to part with money. The subsequent whine about heavy expenses is equally useless. What have such matters of finance to do with an outsider? These things are surely the concern of the manager and the directorate, and mention of them serves merely to suggest that the firm is in financial difficulties. The recipient of the letter, after having been annoyed by the opening remark, will rather feel inclined to rejoice at this fact. I give this example merely to show how a foolish collection letter may easily be written when the author is in the wrong frame of mind. The writer of this letter was evidently annoyed at the stubbornness of a number of debtors at a time when heavy expenses were looming. Undoubtedly his anger was justified; but it was not the most happy moment at which to draw up a form letter. The opening sarcasm, followed by the talk of expenses, shows clearly that the letter was thus hastily composed in an hour of ill-humour.

Sarcasm is a delightful weapon, and for the purpose of pointing out the follies of mankind it is unrivalled. But it should never be used personally, particularly in a letter, and, more particularly still, in a business letter. For satire or sarcasm is useless against the person satirised. Either he does not see it, or he is merely embittered. It is the rest of mankind who perform the reforming function. They hear or read the satirical remark, and are amused. It is not directed against themselves, and it serves to illuminate the object satirised much more clearly than their own minds have hitherto been able to conceive it. They begin to realise the folly of the custom, and the persons responsible are ultimately laughed out of countenance. Satire, therefore, however brilliant, requires an audience; and a letter is seen only by the recipient.

It is not now the fashion to steal, nor is it held polite to bear false witness against one's neighbour; but tardiness in the payment of accounts is practised by the very best people, and is not, in consequence, a sin. If, however, the weathercock of custom were swung to-morrow, and unpunctuality in payment became a breach of etiquette, few would be found to possess the courage to ask credit, and debt would be confined to cheap suburbs and the slums. But what person of influence will first dare to proclaim it "bad form"?

PELHAM SWINTON.

THE PHOTOGRAPHY OF CHILDREN.

[A notable feature of the recent Blackpool congress of the Lancashire Society of Master Photographers was the paper read by Miss Flemming, F.R.P.S., of the Freckleton Studio, Nottingham, which, by the kindness of the author, we are able to print. The paper was illustrated by a number of lantern photographs, the description of which in the text well emphasises the many interesting suggestions and hints which are given by Miss Flemming from her wide and specialist experience in the portraiture of children.]

We each have our ideas and ways of working, and it is a good thing, too, otherwise the photographers' windows would lose half their attraction, and there would be no individuality. But surely it is good for everyone to try to interchange ideas, both from the friendly and the business point of view.

Photographing the children is one of the most interesting branches of photography; but by no means the easiest. As you all well know, it is not merely knowing how to manipulate one's camera, and what exposure to give; it is getting the little folk to look natural and happy, and they won't give you *that* expression unless they are absolutely at home with you, and real friends. Still it is not usually a difficult matter to get friendly with them, only it takes longer with some than with others.

The shy, sensitive child is the kind one has to be very careful with, and it is a mistake to try to be very friendly with them in a hurry. At Mr. Freckleton's studio in Nottingham, we have a very comfortable room adjoining the studio, which is used mostly for getting the children ready in. It is considerably larger than the ladies' dressing room; there is plenty of room for the children to play about, and also for the mother or nurse to get them ready.

We have a private telephone through from the studio to the reception room, and if some children are coming in to sit, the receptionist usually rings through and lets me know. She usually waits until they are out of the reception room and on their way upstairs before ringing through, and then she will often give me an idea of the kind of child that is coming up. Perhaps it will be "Mrs. Smith is getting her little girl ready in the children's room; she says she is dreadfully shy with strangers, and is afraid you will not be able to take her." My receptionist is, I know, smiling to herself, as the idea of our not being able to get a picture of the little one rather amuses her!

I give Mrs. Smith and her little maid a few minutes to settle down before going to see them, and when I do go I take not the slightest notice of the child, but start talking quietly to the mother, letting her know that it will not be a

difficult matter to make a picture of somebody, if she will be good enough to leave it to me and not worry the little one in any way. Then I go back to the studio, and, knowing the kind of photograph required, get the background ready, camera focussed on a few toys put ready on the floor, or on a small table, plate, etc. Mrs. Smith is then asked if she will bring the little one in and let her sit or stand near the toys. Before the child has reached the studio I vanish into another room, and stay there until the kiddie is used to her surroundings and evidently interested in the fresh playthings. Then is one's chance to come quietly in (taking no notice whatever of the little one) and slip behind the camera, which probably may require focussing again.

Underneath the camera we have a musical box fixed so that it is not seen, and when I think the little one is in a good position I just press the spring which sets the music going. The child is usually so astonished that it forgets all about its shyness, and you have plenty of time for an exposure.

But the expression is apt to be one of surprise, and we want a more confident look.

Generally by the time you have made one exposure the child is feeling more used to its surroundings, and you can venture to show yourself a little. But even then I usually find that with a very shy child it is best to keep away from it. If it shows signs of getting tired, we try to find a fresh toy, and give it to the mother to hand to the little one. Very often a simple little thing like a flower will draw a smile from even a tiny child when toys have failed.

Such a shy, little maid of four or five years was brought up to me one day, and I tried her after a little while with various toys, but she looked at me with big, serious eyes, and not the ghost of a smile could I conjure up. There was a big bowl of large yellow daisies in the studio, so lifting them out of the water, I scattered them all round her on the floor where she was sitting, letting two or three of them fall in her little lap. You should have seen the smile dawn on her little face. There was no further trouble with her expression after that.

Some little folk are dreadfully matter-of-fact and grown up, even at four or five years old and younger. You have to be very careful as to how one tries to entertain these precocious little beings, or you may suddenly be made to feel *very* small. Some years ago Mr. Freckleton had a wee mite of perhaps two or three years to photograph, and it was one of those rather stolid children who seem to have no expression or animation in their faces. He was playing bo-peeps to it behind the camera cloth and cutting funny capers generally, anything to rouse some sort of expression into the youngster's face, when all at once the child turned round to its mother, and exclaimed, "Oh, mother, what a funny man!" Well, that broke the ice; everybody laughed; it sounded so grown-up from such baby lips.

But, as you all know, some children are much easier than others to photograph; some are bright and full of confidence, others are just as dull and apathetic. Then, hardest of all, there is the spoilt child who is usually brought in by a fond mother, and two or three equally fond aunties. They immediately start to tell you that he is *the most wonderful* child that ever it was your privilege to photograph; you are thinking to yourself that you would not very much mind forgoing that privilege. If possible, only the mother, or perhaps the nurse, should be allowed to stay in the studio, and, as a rule, I find it easier to get a picture of a spoilt kiddie, if *no* toys are shown to it, and as little notice taken of it as possible. Also, it is best to be as quick as possible with this kind of youngster, and not attempt to play with it; just to attract its attention by a touch of the musical box will often do the trick.

A very difficult child to deal with came to the studio the other day. The youngster was naturally very shy and nervous with strange people, and was unfortunately spoilt into the bargain. It was no sooner brought up into the children's room than it started to scream as hard as it could. The mother was promising it chocolates and a good whipping alternately, and I could see there was small chance of a picture that morning. It had been told all the way coming that it must be good, as it was going to have its photograph taken, but the only idea that the youngster's little brain retained was that "it was going to be taken." Where, it did not know, but the poor little beggar was really frightened, as well it might be. Advising the parents to come another day, I also suggested they should not say anything further to the child about being "taken," but let him forget all about it if possible. If they would bring him in again in a week at the same time of day, and have him brought in at the other entrance to the studio (there are two ways into that room), I would have everything in readiness, and we hoped that by coming in another way he might forget his previous fears and give us a chance of getting him unawares.

They did so, and, coming into the room from an entirely fresh end, and also seeing no one about and a new toy lying on the floor, the child was not so nervous, and by the time five minutes or so had elapsed I ventured to show myself at a distance and slip behind the camera. By and by I got a couple of exposures, one of which was fairly good. Only a small order was the result at that time, but the parents remembered that the child had been treated tactfully and kindly, and they brought it in again next year. The child was older, gave far less trouble; and a good picture, followed by a good order, was the result.

I am only telling you this to show that it pays in the long run to have patience. Your customers do not forget it, and they tell other people, too. I find it a good thing to notice the kind of toy children like, and, as far as possible, let them have their choice, even if you may not think it quite suitable. One little lad would have nothing else but a skipping rope, rather a girlish toy, but it met with his approval. Others, again, are very anxious you should photograph their own dolls, and it is not wise to refuse, even if the teddy bear or the doll is nearly double the size of the kiddie. I take one negative to please the child, and then another that I think will suit the mother. You gain the child's approbation, and that is half the battle.

Sometimes it is a great help, if toys fail, to let the children play about and pretend to take a photograph themselves. They get so interested, and it is such fun to them, that it is an easy matter to get a good expression of them when you subsequently take a negative. It all takes time, but I find it is well worth while.

By the way, a cat is always useful in the studio, as most children are fond of animals. We have had one for fourteen years, and he is very good indeed at sitting with the little folk.

If you are, however, fortunate enough to posses both an intelligent dog and a cat that are on friendly terms with each other all the better; you can use them both when needed.

Of course, you may not be able to find a dog as well trained and devout as one of Mr. Freckleton's, but I find most terriers are very teachable, and patient, too.

I will next show a slide which may perhaps give you an idea of how you can get a homely-looking little picture, by making use of both the cat and a bit of sunshine on the floor. It was morning in summer time, and the cat had found the warm patch of sunlight. So putting the child into a comfortable little chair near the cat, I gave it a book of coloured pictures to look at. The rest was quite easy. Talking of sunshine, the little bit that comes in through the side-window at one end of the studio for an hour or two in the mornings is most useful for making a change in one's style of picture during the summer months.

Our studio is practically divided into two rooms by means of curtains drawn right across the middle; these can, of course, be thrown right back when we have a large group to take. One end has a top light and also half-watt lamps fitted high up in various parts of the ceiling, so that we can take our sitters in any part of the room. The other end is lit only by a large side window, and it is through that window in the morning that the useful little ray of sunshine comes.

Another of my slides shows a different effect, because the kiddie is standing very nearly with her back to the window, and the little face is lit chiefly by reflected light. To make the picture look as sunshiny and spring-like as possible, I turned the background slightly at an angle towards the window, so that it was lit up almost as much as the child, and on the side of the ground where the little hands are I pinned a few long sprays of blackthorn. Terribly prickly stuff it is, too, but just the thing for a spring picture. I removed the longest of the thorns before letting the child's little hands come near.

Here I show you two youngsters playing at school with the dog to assist. I am afraid the dog did not see so much fun in it as the kiddies; all he saw was a piece of dog biscuit waiting for him on top of the camera. Of course, it is not a good likeness of the two children, dressed up as they are, but before they leave the studio we always get two or three negatives in their ordinary dress, showing more of the little ones' faces. These "play pictures," as we call them, are really a good investment. They are a bit out of the common, and even though the parents do not select them for their order, they generally like to have one copy to keep for themselves, and that is usually shown to their friends. The friends in question admire it, and think they would like to take their little ones to a studio where the children are allowed to play and have a good time. Then, again, an enlargement from one of these "play-pictures," hung up for a short time in the show-room, is always an attraction and interests the customer.

Last summer I had a wedding party to photograph in their own garden. When the bride and bridegroom had been taken and were on their way to the station, I got the four little bridesmaids to come with me into the next garden, where there was a small fountain. I arranged them round this, turned the water on slightly, and let fly with two or three plates. The kiddies thought it great fun, because they could run about the grass without their shoes and stockings and play with the water. What their mothers said when they saw the wet frocks I did not wait to hear!! This picture was put in the show-case with the wedding groups, and, being something a bit out of the ordinary, made people talk.

I spoke a little while ago about the usefulness of flowers in a picture. Now and again one gets a rather plain child to photograph, and then a few flowers come in handy, either out of doors or in the studio.

Flowers are often useful in the studio. Here is a child sitting on a fairly large table, and two big bowls of flowers and grasses are standing on the same table. One is slightly at the back of her; the other one she is holding in her lap. The two vases are of such a height that they do not show in the picture, only the tops of the flowers, and just one or two long sprays of grass which break the line of flowers, and, at the same time, merge softly into the background. Out of doors is easier, especially if there are some of those tall daisies anywhere about. Let the child gather a few, and it will forget to a great extent that you are going to photograph it; you will then get a more natural expression.

In making a picture of a young mother and baby, I find a simple wicker crib very useful. The crib rests on its own wicker stand and is about 3 ft. from the floor, so that the mother can sit comfortably on a chair and lean over her baby.

In making fire-light pictures of a little girl I find it best to tell her to hold her hands out to the fire and see how warm it is, or to swing her dollies to sleep in the warm glow, and even though the fire is only electric, the child usually enters into the fun of it, and does as requested.

For pretty fire-light studies, however, I prefer an older child. Children seem to me to call for sunshine more than fire-light. The next three slides do not exactly deal with "Methods of Child Photography," but they may perhaps interest you as ordinary home work in the winter evenings.

The first was taken in Mr. Freckleton's dining room just after supper, while the white cloth was still on the table. The only illumination was five ordinary incandescent gas burners lit under orange-coloured shades. Roughly speaking, the exposure would be about four or five seconds. Those are red apples in the fruit dish, and that is an orange that Mr. Freckleton's daughter is peeling. This picture and the two following are all taken on Marion's Iso Record plates.

The family gathering round the fire was taken at 9 o'clock in the evening, and the only illuminants were two half-watt lamps, each of a 100-candle power—one up in the centre of the ceiling and the other in the stand lamp you see in the picture. The shade over this lamp was also orange-coloured. Talking of the winter evenings, I will tell you what we do at the studio after Christmas to try and make fresh customers when things are a bit slack. We have what we call a "lantern social" in the evenings, say, about once a fortnight, and throw on to the screen probably a 100 or more chudren's pictures during the hour and a-half that the "social" lasts. Invitations are sent out to several ladies who have already brought their kiddies to sit, and they are asked to bring a friend with them. Suppose you send out about fourteen invitations, and perhaps twelve accept; that means you will have twenty-four guests to attend to. That is really enough, I find, to look after, if you are to give each one a little personal attention, and it pays to do that. We usually start our social at about 7.15. After showing the slides, which generally occupies about an hour and a-quarter, the lights are all turned up again, and cups of nice, hot coffee and a few biscuits are handed round. The customers thoroughly enjoy it, as it is a novelty; it does not take long to get the studio ready and the lantern fixed up. The white backgrouud is always ready to act as a screen, the camera stand is just right to carry the lantern; we fetch a few more cosy chairs up from the reception room, fill a bowl full of fresh flowers, and your social room is ready. My assistants are very good; they take it in turns to stay and help with the coffee, and in making the customers feel at home and comfortable.

A most important thing to remember is *always* to have slides of those children, whose parents are your guests for the evening, ready to put on the screen. It is *those* pictures they look forward so proudly to show to their friends. We generally invite the ladies only, thinking that it is perhaps rather a tame entertainment for the gentlemen, especially as there is only coffee at the end of it, but several times the fathers of the kiddies have come and have quite enjoyed it. One special evening we invited the children as well as the parents, and, as the Americans would say, it was "some night." It was rare fun to hear some of those youngsters' remarks. But it did a lot of good, from the business point of view, because the children talked a lot about it afterwards to their little friends. If only we can give the people something new and good to talk about, we ought not to have many slack weeks. The secrets of success are, I venture to think, to keep up to date, always try to find something new and attractive; above all, see that one's work is good and turned out promptly.

FANNIE FLEMMING, F.R.P.S.

PHOTOGRAPHIC MATERIALS AND PROCESSES.

[Regularly each year the Society of Chemical Industry renders a valuable service to those connected with the manufacturing and scientific sides of photography by including in its "Annual Reports" one on photographic materials and processes. The report for the year 1921 is written by Mr. F. F. Renwick, F.I.C., whose large share in photographic research qualifies him exceptionally as a recorder of recent investigations in the technical improvement of processes of making negatives and positive prints, orthochromatics and colour photography, cinematography, and photo-mechanical processes. The report exhibits the work which obtained publication last year in its relation to previous knowledge better than any other communication which comes before the photographic industry, for which reason we endeavour to find a place for it in our pages. As regards the references to original sources of publication, it should be explained that the contraction "J" denotes the fortnightly "Journal" of the Society of Chemical Industry, in which are published abstracts of the chief papers dealing with the chemical side of practical, scientific, or industrial photography.]

The first steps towards the achievement of photography as a practical art were largely due to men of acknowledged scientific repute of British birth. The names of Tom Wedgwood, Sir John Herschel, Sir Humphrey Davy, Henry Fox Talbot, and Robert Hunt readily occur to the mind as distinguished men of science who devoted considerable attention to the subject in the first half of last century. Herschel, Fox Talbot, and Hunt all added considerably to the list of known photochemical reactions, and to Fox Talbot belongs the distinction of working out more than one process to a successful issue and of introducing the method of producing positive prints from a negative and so enabling the production of any number of copies. It is highly fitting therefore that the Royal Photographic Society should recently have undertaken the guardianship of Fox Talbot's apparatus and results and the setting up of a permanent memorial to him.

Towards the end of last century, after the establishment of numerous firms for the wholesale manufacture of sensitive materials, very few men of note in the scientific world devoted themselves to the study of photochemical problems in spite of their profound importance and interest, but the death, at the close of last year, of Sir Wm. de W. Abney removed from our midst one whose name will always be associated with his valuable contributions to photographic science which traversed a very wide field both in the chemical and the physical aspects of the subject.[1]

The present flourishing photographic industry owes its development almost entirely to the dogged energy and perseverance of a number of untrained enthusiasts whose names are mostly unknown to scientific men, and it is probable that in the whole world there were not a score of well-trained chemists employed in it thirty years ago.

The present outlook is very different. In the first place the industry has absorbed and trained a considerable number of young men who had first received an education in scientific method and who have elaborated Hurter and Driffield's invaluable system of examining and classifying photosensitive materials, so that to-day quantitative modes of expression are, or should be, regularly employed by all serious workers to describe their attributes.

Secondly, the industry has become so huge and complex that it would be impossible to produce the required quantities and the variety of these very delicately balanced products with reasonable uniformity without an elaborate system of scientific control. (In illustration of the magnitude of the industry the following figures are instructive. Approximate number of cinema theatres in existence 90,000; estimated length of cinema film exhibited every week 300,000 miles, of which at least 10,000 miles represents entirely new matter, no allowance being made for the enormous amounts consumed which are never issued for exhibition. To this must be added all the roll films and plates and the positive printing materials of all kinds used in other photographic work, both professional and amateur.)

Thirdly, as a consequence perhaps of the industrial difficulties which have arisen since the war, there is a keener appreciation of the overwhelming importance of light as the prime cause of those innumerable natural synthetic and analytic reactions on which all living matter depends for its growth and development, and as a result we observe a great revival of interest in the mechanism of photochemical changes and a desire to direct and control them for the service of mankind. It has become evident that efficient photochemical manufacturing processes would save the community the expenditure of much manual labour and postpone the depletion of our rapidly dwindling and irreplaceable supplies of coal and oil. Moreover, if such processes can be colour-sensitised effectively there seems less reason to assume they would require to be carried on in tropical climates to be economically successful.

Photography then, should be regarded as merely the first photochemical industry to be established, and as such it cannot fail to benefit from the researches in other branches of photochemistry, the study of catalytic reactions, and particularly from investigation of heterogeneous reactions in colloidal media which appear in the future.

As evidence that British photographic chemists are alive to the importance of widening their outlook, the appearance of a new journal published by the Scientific and Technical Group of the Royal Photographic Society under the title "Photographic Abstracts" is a most welcome sign and deserves the support of all serious workers in the subject. The enlightened policy of those firms who jointly bear the greater part of the cost of this publication is highly praiseworthy and cannot fail to be rewarded through the greater zeal for and efficiency in the performance of their duties which it will surely evoke among their technical staffs.

Photography has undoubtedly regained much of its popularity as a pastime, and the lure of the cinema theatre seems irresistible to the majority; moreover, the employment of photo-mechanical processes for illustration work continues to grow steadily, while professional and scientific photography continue rapidly to multiply their already numerous ramifications, so that if a reasonably early return to normal trading conditions should occur it is safe to predict a considerable permanent expansion of the industry. There is a far wider and more intelligent appreciation of the advantages of colour-sensitive negative-making materials for all kinds of work than before the war, probably as a consequence of the large numbers of men who learned from experience on active service how indispensable such plates were to our success. There are indications of a desire on the part of manufacturers to simplify their problems by producing only a few articles in large quantities, but it has long since been found impossible to produce even one product which suits all tastes, so many and so subtle are the requirements of different users.

While the importance of photography in everyday life is but dimly realised by the general public, few even among the highly-educated classes realise what an effect it has had on man's intellectual life during the past two years. But for the fact that a few star images occupied certain positions on a few photographic plates exposed at the solar eclipse in 1919, it is certain that the majority of us would have taken no interest in theories of relativity. An attempt to verify these observations on Christmas Island in the Indian Ocean and elsewhere at the eclipse next September is already organised and will again rely on photographic records of apparent star positions, when doubtless there will follow another flood of ideas on this abstruse subject. In delicate work of this character careful attention must be paid to various disturbing factors, such as the mutual influence of adjacent images—a subject recently re-studied by F. E. Ross.[2]

During the past year the photographic industry has suffered from the prevailing world-wide trade depression, though perhaps less acutely than most. There was a marked fall in the prices of fine chemicals during the summer months, but this advantage may be lost, presumably to the benefit of the fine chemicals trade of this country, by the operation of the Safeguarding of Industries

1. Sir W. Abney, *Phot. J.*, 1921, *61*, 44, 296.

2. F. E. Ross, *Astrophys. J.*, 1921, *53*, 349.

Act, 1921, which came into force on October 1 last, since every fine chemical and almost all the apparatus used in the industry fall within its scope.

At the date of writing, the depreciated value of the German mark apparently outweighs any encouragement which the Act might have given to our fine chemicals industry, while this measure certainly makes the obtaining of rare synthetic chemicals from abroad an extremely aggravating process.

Raw Materials.

Among the raw materials of the photographic industry, the three which call for the greatest care, judgment, and experience in their selection and use are gelatine paper and collodion cotton. There are no generally recognised methods of testing any of these products for photographic purposes except the obvious one of trying them on a small scale and noting the results before proceeding to large-scale use, and it must be admitted that at present there seems little prospect of devising really reliable chemical methods of testing them.

It is satisfactory to be able to record that considerable progress has been made in this country and elsewhere during and since the war in the production of first-class gelatines suitable for all photographic purposes, and we are now quite independent of Germany in this matter.

Regarding paper stock suitable for bearing sensitive emulsions, some progress has also been made, but of a more limited character. Supplies of collodion cotton of British manufacture suitable for preparing print-out collodion emulsions are also more easily obtainable than in pre-war days.

While a great deal of new work on gelatine has been published during the past year, a proper appreciation of the bearing of modern research in this field of photographic problems is as yet impossible. It becomes daily clearer, however, that there are numerous facts, with which most photographic works chemists are familiar in practice, whose interpretation is rendered easier by the aid of the newer theories dealing with colloidal forms of matter, and it is to be hoped that the photographic industry will derive some benefit by the adoption of the methods of examining gelatine which are gradually being worked out.[3] In many cases, however, these are little more than slight modifications of old physical tests which have been long since found to be of no great assistance to the emulsion maker.

What is urgently needed as a beginning is a satisfactory method of determining the relative proportions and characteristics of the hydrolysed and anhydrolysed constituents of commercial gelatines. A ready means of separating them unchanged would enable their separate influences on emulsion-making processes to be properly studied and the diverse photographic qualities of different brands of gelatine to be correlated with their chemical as well as their purely physical differences. Moeller's recent studies[4] of Procter's discovery that the addition of a little acid precipitates dissolved gelatine from saturated solutions of common salt leaving the degradation products in solution, appears to offer an opening for attacking this problem.

Several new patents for flexible supports of a non-inflammable character have been granted,[5] but from one cause or another the proportion of positive film of the "non-flam" type shown in picture theatres is still quite small, hence it would seem that the ideal support is still to seek.

Storage of Sensitive Materials.

One of the most intricate problems constantly confronting the manufacturer of light-sensitive materials is the preservation of their properties unimpaired up to the time of use—a period which may amount to several years, under the most varied climatic and other conditions of storage. The problem presents two essentially different aspects; firstly, the exclusion, by the use of more or less impermeable wrappings, such as sealed tins, foils, waxed papers, etc., of moisture and injurious gases or vapours, and secondly, the discovery of stabilising agents or of improved processes of manufacture which will arrest or minimise any tendency to spontaneous changes in the sensitive materials themselves. Naturally enough, discoveries falling within the second category are not usually published but become jealously guarded trade secrets, so that the chemistry of stabilisers is an almost unexplored field of scientific inquiry.

A novel mode of protecting a photographic film against moisture has been patented by F. W. Lovejoy,[6] who applies to the surface a transparent layer of a fatty acid (palmitic or stearic) which is saponified and dissolved by the alkali of the developer. E. Merck and L. Weber[7] claim the addition of certain salts, e.g., ammonium oxalate or acid phosphate, to the sensitising ferric oxalate preparation for improving the keeping quality of negative tracing (blue print) papers. A report by the Eastman Kodak Company[8] deals with the fading of finished prints made by the same process and recommends that instead of plain water, a 0.2 per cent. potassium ferri-cyanide solution be used for development. It condemns the practice of adding hydrogen peroxide to the development water as conducive to rapid fading.

Before proceeding to deal with the more usual chemical and photochemical side of photography two very ingenious inventions must be mentioned.

The first is Louis Lumière's method[9] of producing a composite photograph giving a very satisfying illusion of solidity (photo-stereosynthesis). He prepares a number of positive transparencies of glass, each of which depicts sharply a slightly different plane of the object, other planes being thrown out of focus by special optical devices during the making of the original negatives. These transparencies must be properly spaced in due order one behind another, in a framework lighted from the rear and viewed normally to secure the desired effect.

The second is H. M. Edmunds' invention enabling relief models in wood, ivory, etc., to be produced mechanically from a photograph (photosculpture).[10] A spiral pattern is projected optically on to the sitter's head and shoulders and appears on the photograph as a close series of contour lines. A special machine is employed to translate the motion of a stylus along these contour lines into the appropriate motion of a cutting tool on the block of material employed. The results shown in last year's photographic exhibitions are certainly very interesting.

Aviation has led to the development of new and important applications of photography to surveying and map-making from aerial photograpns. The progress already made in this highly technical subject has been ably reviewed by L.-P. Clerc.[11]

Cinematography.

Cinematography has reached such enormous dimensions that it must now be regarded as a separate industry of a highly complex character, which uses huge quantities of sensitised negative and positive film as its chief raw materials, rather than as a branch of photography. Nevertheless, any further improvements in these raw materials must depend on the chemists and emulsion makers in the photographic industry and will naturally find many other fields of application, but such progress is necessarily rather slow. The energies of research workers in cinematography are mainly devoted to the solution of optical and mechanical problems with which this report does not profess to deal.

It is of interest, however, to note that inventors appear to be chiefly engaged on four problems:—

1. The elimination of the disadvantages arising from the intermittent projection and the discontinuous motion of the film through the projector. A large number of devices permitting continuous motion of the train of pictures has been patented[12] and some of them publicly exhibited, so that it may not be long before flicker, underlighting, film breakage, and other evils will be things of the past.

---

3. S. E. Sheppard and S. S. Sweet, *J. Amer. Chem. Soc.*, 1921, *43*, 539. H. D. Dakin, *J. Biol. Chem.*, 1920, *44*, 499; *J.C.S.*, 1921, *120*, i., 66. S. E. Sheppard and S. S. Sweet, *J. Ind. Eng. Chem.*, 1921, *13*, 423. S. E. Sheppard and F. A. Elliott, *J. Amer. Chem. Soc.*, 1921, *43*, 531.

4. W. Moeller, *Kolloid-Zeits.*, 1921, *28*, 281; *29*, 46.

5. F. Schaurich, *Kunststoffe*, Nov., 1920, 207. S. H. Wood, U.S.P. 1,364,342; *J.*, 1921, 164A. H. Dreyfus, U.S.P., 1,363,364-5. G. W. Miles, E.P. 166,033.

6. F. W. Lovejoy, U.S.P., 1,342,590; *J.*, 1921, 164A.

7. E. Merck and L. Weber, G.P. 331,745; *J.*, 1921, 325A.

8. *Eastman Kodak Lab. Rep.* No. 1091; *Phot. Abst.*, 1921, No. 346.

9. L. Lumière, *Comptes rend.*, 1920, *171*, 891; *Brit. J. Phot.*, 1921, *68*, 110; *Bull Soc. Franç. Phot.*, 1920, *7*, 262.

10. H. M. Edmunds, *Amat. Phot.*, 1921, *52*, 189; E.P. 170,685.

11. L.-P. Clerc, *Phot. J.*, 1921, *61*, 381.

12. K. Higginson, E.P. 165,114 and 165,487; see also *Phot. J.*, 1921, *61*, 261. C. H. Claudy, *Scient. Amer.*, 1921, *124*, 288, 297, 299. C. Zeiss, E.P. 146,209. Petra A. G., E.P. 154,873. W. C. Plank, U.S.P. 1,366,488. M. F. and L. D. Hill, U.S.P. 1,367,475. E. H. Lysle, U.S.P. 1,367,487-8. J. A. Perry, F.P. 512,298. O. Messter, G.P. 331,650 and 332,273. C. W. R. Campbell and F. G. A. Roberts, E.P. 161,329. B. Mechan, F.P. 516,277.

2. The discovery of a satisfactory method of imparting the appearance of stereoscopic relief to motion pictures.[13]

3. The perfection of a simple means of synchronising sound records and motion pictures—a feat which was shown to be possible in skilled hands with separate gramophone and cinema records at the Brussels International Congress of Photography in 1910.

Recently, however, considerable success has attended efforts to combine both the picture and the sound record on one film. Variations in opacity in the photographic sound record cause rapid fluctuations in the intensity of an electric current passing through some form of light-sensitive cell, and these operate suitable amplifying telephonic devices for reproducing the original sounds.[14]

4. The production of satisfactory motion pictures in natural colours.[15]

In regard to this long-sought goal it appears fairly certain that for some time to come a two-colour system, in spite of its serious limitations, is more likely to be a commercial success than a three-colour method, since the latter inevitably offers far greater technical difficulties. Modern developments indicate that a practical solution is likely to be found first either in a method by which each unit picture on the film is a composite record in colour which can be used in existing projectors without alteration, or by one of the optical methods enabling the simultaneous making of the two records on adjacent areas of one film through a single lens and projection through two adjacent colour filters to combine on the screen.

F. F. Renwick, A.C.G.I., F.I.C.

(To be continued.)

GERMAN SCIENTIFIC INSTRUMENTS.

The Board of Trade Inquiry Committee.

The Board of Trade Committee, which has been charged with an inquiry into the question of German optical and photographic goods, with a view to the possible necessity of imposing an additional duty, resumed its sitting on May 31. The first part of the proceedings, in which the case for the applicants was stated, was reported in our column of May 19. Sir Henry Rew, the Chairman, stated that the case for the applicants had now been closed, and the shorthand notes of the evidence were available; he therefore called upon the counsel for the parties resisting the application, Mr. T. W. H. Inskip, K.C., M.P.

Mr. Inskip said that he had to present to the Committee the substance of the case to be put forward by seven firms, two of them interested in the supply of German photographic instruments, and the others in more purely optical manufacture. He excluded the question of drawing instruments, which was of almost insignificant proportions. The broad case which he presented with regard to the other articles which formed the substance of the inquiry was that the facts were not as had been alleged on the other side. Some of his own witnesses were sole agents for firms which manufactured in Germany, and they contended that while the very cheap articles which had formed the subject of the complaint had not come into the country by backdoor methods in the sense of smuggling, they did represent, nevertheless, a class of articles whose sale outside the ordinary channels of agency was really illegitimate, though he did not use the word in any opprobrious sense. He maintained strongly that the articles of German manufacture which came into this country through the regular channels of duly appointed agents were well comparable in price with similar British articles. He dismissed the plea, which was implicit in some of the evidence already tendered, that the industries concerned deserved some special treatment, either because they were important, or because during the war special efforts were made to establish them in this country. He did not think that that was the basis of the applicants' case. A suggestion which was far more strongly pressed was that this importation from Germany led directly to a diminution in labour and output in this country, but he thought it was overlooked that there was a very great depression in trade generally. What surprised him most about the evidence already tendered was that so little had been said about depreciated exchange. The ability of the German to undersell the English competitor arose from the fact that the internal value of the mark was very different from its external value. If it were not for that difference between internal and external value, the mere depreciation of the mark would not place the Germans in an advantageous position for competition. With the approximation of the internal to the external value of the mark, which might be anticipated, this underselling would tend to disappear. He noticed that witnesses on the other side had been rather shy of suggesting that employment would be increased if an extra duty were imposed; the most that could be hoped for was that competitors would be handicapped.

After dealing with the case of prism binoculars and microscopes, which, he said, broadly speaking, were not sold at prices below comparable English makes, he said that he would call Professor Bone, of the Imperial College of Science, who would give evidence that for scientific research the best instruments, German or British, must be provided, regardless of price, so that the effect of putting on an additional duty on foreign importations would simply have the effect of causing extra expenditure to scientific institutions, and would not make for protection, because the goods must be obtained whatever price was put upon them. With regard to photographic lenses and cameras, he had two witnesses on this point. One of them, Mr. Robert E. Peeling, was the distributing agent in this country for the manufactures of the Goerz firm, and for certain others; the other was Mr. R. F. Hunter, distributor of the Contessa and Nettel cameras and other apparatus. Both of them contended that while there was a certain amount of importation of German instruments by irregular methods, this was in the face of the efforts which they themselves were making against it, and which they would be in a position presently to make more effectual. It was not the regular German trade which the British manufacturer had reason to fear, but the casual efforts which adventurers were making in this field. A point to be remembered in connection with the complaint of the British houses was that they had been very much overstocked, and that until the stocks in the hands of the dealers could be released there must naturally be lessened manufacture, irrespective entirely of German importations. Then, again, there was significant evidence that plate cameras were going out of fashion; except in certain sections of the photographic industry, where the plate camera was still used, for reasons with which he was not acquainted, the roll film camera had ousted it, and some makers of British cameras had had to reorganise their business. These manufacturers were at present in a transition stage, some of them with very large stocks of the older patterns, which they must liquidate before they could get into full manufacturing order. But it was not to enable manufacturers to do this that the duty was conditionally imposed by Parliament. He read some figures from a reply to a question in the House of Commons by the President of the Board of Trade, that 324,998 cameras were imported from all countries in 1921, of which number 13,233 were sent from Germany. It was not the German competition really which affected this camera question. The popular camera, or the one which had made the greatest impression on the mind of the public, was the Kodak production, which really fixed the rates charged for cameras in this country. Even supposing that the 13,000 German cameras were eliminated, when one remembered the vast extent of the Kodak sales it was difficult to think that the price of the British camera could be raised to any figure which could increase employment to the extent desired by the applicants. It had been stated that the agents for certain German houses gave extremely large discounts. This was quite wrong, as he could call evidence to prove. The suggestion that the Contessa and Nettel cameras represented a new industry in Germany was also mistaken. The products of the houses concerned had been familiar for a long time; all that had taken place was an amalgamation between the two firms concerned. He also referred to the very great variety of models of cameras on sale, and maintained that while great disparities in price might be shown as between camera and camera, if parallel German and British models were selected for comparison the disparity would appear very small indeed.

Mr. J. W. Atha, of J. W. Atha & Co., distributors of the products of Carl Zeiss, spoke mainly as to prism binoculars. As to

13. R. Gaines, F.P. 507,633. J. L. Pech, *Scient. Amer.* (*Monthly*), 1921, 531; *La Nature*, 1921, *49*, 75. L. L. Ruffier, E.P. 152,367. F. N. Hallet, U.S.P. 1,362,249. A. d'Halloy, F.P. 514,076. S. Türk, G.P. 334,383. A. R. Boorman, E.P. 165,487.

14. L. A. Collins, U.S.P. 1,366,446; *Times*, Sept. 24 and 28, 1921; *Nature*, 1921, Oct. 27, p. 276.

15. Natural Colour Pictures Co. (W. F. Fox), E.P. 143,180. E. C. S. Parker, E.P. 507,724. L. Furman, U.S.P. 1,371,969 and 1,371,970.

photographic lenses he maintained that the prices of the German makes were comparable with those of the British. With the exception of the lenses of Ross, all British makes of lenses were rather lower in price than the products with which he was concerned. Before the war it was on record that Zeiss supplied lenses in large numbers to British camera makers; since the war and up to the present time, British camera makers did not list—and had agreed among themselves not to list—Zeiss, Goerz, or any other German lenses.

The Chairman: Is the Zeiss firm not sending any photographic lenses to this country?

Mr. Atha: Certainly, sir, through us.

The Chairman: To what extent?

Mr. Atha: Practically infinitesimal for British consumption in comparison with what it was before the war.

The Chairman: What is the actual extent of the trade now?

Mr. Atha: Almost negligible. Before the war our principal customers were the large camera manufacturers. These manufacturers since the war have bought not a single lens from us. What lenses have come through are mostly for re-export.

The witness said, in conclusion, that all the German manufacturers arranged their prices in the various countries in the sterling of the country to which the goods were going, that the prices for German goods were invariably higher than English prices, and that during the last six months Messrs. Zeiss had increased their workmen's wages by 100 per cent.

Professor J. W. Bone, of the Imperial College of Science, gave evidence in support of Mr. Inskip's opening statement, that for scientific research the best equipment possible must in any case be provided, so that the effect of adding an increased duty would only be to raise the cost to such institutions, and would not exclude the products.

Mr. R. E. Peeling, agent for Messrs. Goerz, and for F. Deckel, of Munich, photographic shutter manufacturers, and Gustav Heyde, of Dresden, makers of actinometers, said that his firm had been sole agents for Goerz since October, 1920. He gave instances of German cameras which were higher in price than similar articles of British manufacture. Generally speaking, German cameras were not cheaper. In value German cameras represented about 7 per cent. of the whole camera trade in Great Britain at the present time; before the war the proportion was 12 per cent. He believed that Goerz and two other companies represented 80 per cent. of the total German export trade in cameras. He was connected with Goerz before the war, and compared with the turnover of the Goerz agents in this country in 1913 the present turnover was about 22 per cent. In answer to the Chairman, he said that there was a public demand for Goerz cameras. They met a requirement which was not met by British makes. Some of the models were not touched by British manufacturers at all. The greater proportion of the Goerz trade was in roll-film models which British manufacturers did not favour. His firm sold eleven roll-film cameras to every two plate cameras. Certain of the plate cameras had no counterpart in British manufacture. In reply to a further remark by the Chairman, he said that he would not declare the Goerz film cameras to be better than any British make; he was not sufficiently acquainted with all the British makes. So far as Kodaks were concerned the Goerz camera was distinctly better, being lighter and thinner, and more compact than the American model. Asked to what he attributed any stagnation in the photographic industry, he said that he attributed it to four causes. In the first place, over-production in 1920. A number of cameras were produced in 1920 to the order of dealers, and disposed of to dealers, but the dealers in turn had not sold them, and while they were on the dealers' shelves no repeat orders were forthcoming. The second cause was the absence of export trade; the third, the general trade depreciation, and the fourth the fact that British manufacturers were not at present producing popular lines. The amateur photographer wanted something which was no bother to him at all, and the British manufacturer did not seem to be content to meet that need. He added that the loss of export trade was due not only to German but to French and American competition. The witness went on to produce two cameras which he compared. One was the Goerz "Tengor," a roll-film camera only introduced this year, and sold at £3 5s.; the other the Butcher "Carbine," which, he said, was in all respects comparable except that it was heavier, listed at £3. It was the lens in every instance, and to a certain extent the size of the shutter, which determined the price of the camera. He gave particulars of his discounts.

Sir A. Colefax, the counsel for the applicants, produced a Houghton "Ensign," and asked whether it was not comparable with the "Tengor." Mr. Peeling said that the Goerz model he had produced was fitted with an uncorrected spectacle lens, while the other had an anastigmat, and this would account for at least £3 difference in the price.

Mr. R. F. Hunter, agent for the Contessa and Nettel cameras, disputed the allegation that there was any dumping of cameras from Germany into this country. The prices at which all the German cameras, for which he was sole agent, were listed were fair competitive prices. He contended that both the Contessa and Nettel cameras were represented in this country before 1914. The two firms were amalgamated at about the same time as the Houghton-Butcher amalgamation. The leather which was used in the Contessa-Nettel cameras was not made in Germany, but in this country, at Nottingham; he did not know where other materials for the cameras were made. The trade had decreased during the last eighteen months owing to a strike at the German factory. He believed that the trade would recover if the cameras could be sold at a remunerative price in comparison with other cameras, but Messrs. Kodak, by whom prices were largely governed, had considerably reduced their prices for one particular type of camera only during recent weeks.

This concluded the case for the parties resisting the application, except for the evidence of one or two representatives of the spectacles industry, and then Sir A. Colefax, counsel for the applicants, applied for permission to bring forward rebutting evidence, designed to clear up the points of seeming discrepancy between the two sides.

The Chairman, in giving this permission, fixed June 19 as the date for the next meeting of the Committee, the long adjournment being necessary in order that the shorthand notes of the evidence might be available.

Exhibitions.

PORTRAITS BY PIRIE MACDONALD AT THE ROYAL PHOTOGRAPHIC SOCIETY.

The eagerly awaited exhibition of the work of Mr. Pirie Macdonald, of New York, the "photographer of men," was opened to the public last week, and will remain open, free to all, until June 30.

As a portraitist who works within narrow and self-imposed limits, the reputation of this strong and individual photographer stands very high, even in this country. Doubtless this imposing show will confirm, by conviction, the lofty esteem he already enjoys here upon authority.

The sixty prints now shown are all what are known as "heads and shoulders"; not a single full or half-length, and not a woman amongst them. But although in this respect similar, their treatment differs far more than at first appears. The method of lighting is a part—a great part, indeed—of Mr. Macdonald's means of expression. Yet this, too, varies within narrow limits. He has his tricks, some of which are rather obvious; but he never descends to trick-lighting for the sake of making a smart or novel effect. Neither is he, in all cases, actuated by a desire to give his heads rotundity. Never positively two-dimensional, yet he does sometimes let the third dimension "go hang." His modelling is always clear to the understanding, but yet it is sometimes local, having little relation to the whole. It is for this reason that one is conscious here of a nose strong in relief, and there of a brow, whilst contiguous parts are, by comparison, flat. It is not for a moment suggested that the author of these works is not fully aware of such variations from a standard of logical representation. It may be his way of bringing out a sitter's characteristics. The talented painter Lembach used constantly to sacrifice a sitter's features to the eyes, into which he made the spectator delve for a psychological reading.

At any rate, it is upon the grounds of psychology that Macdonald's fame rests, and where he would have it rest. There is not a single portrait here that does not speak of the man—the

inner man; and some examples are marvellous human documents. Perhaps the most noteworthy in this respect are Theodore Roosevelt, Abram I. Elkus, Darwin P. Kingsley, S. Jennings Cox, William Rockhill Nelson, Frank Lawrence, and Dr. W. H. Wiley. On the whole, too, these seven may certainly be placed among the best in every respect, thus demonstrating the entire success of the intentions and achievements of the author's work.

One of the outstanding points of Mr. Macdonald's skill is a never-failing spontaneity. His sitters are never allowed to look posey. Most of them are caught in the living moment of some emotion; mirth, cogitation, a winning nonchalance. Or, with even more charm, a few exhibit a natural and unashamed self-consciousness, which, when it is not a sign of embarrassment, is after all the most fitting mood for a photographic portrait. It says plainly, "You want my portrait? Well, go ahead. How will this do?" In such poses there is no attempt to show the statesman wrestling with international crises, or the poet importuning his muse, as though they were nowhere near a camera. The sitter is obviously before the camera and giving his mind to the business of the moment; but none the less *the man*. The adroit use of a hand touching the face in the splendid examplea William Rockhill Nelson and Abram I. Elkus, should be noted and not forgotten.

It has been said that Macdonald makes use of a "spot-light" after he has got the normal lighting to his taste, and that this gives the high-lights that are peculiar to his style. It may be doubted whether the oily effect which this resource produces has in reality any advantage beyond that of a trade-mark. In the Roosevelt and the S. Jennings Cox, to name only two, the sitters look as if they had been caught in Broadway on a mid-day of the hottest summer.

This notwithstanding, the exhibition is one of which any portraitist would be proud. Mr. Macdonald claims it as the best he can put together. It is hard to believe he could ever surpass it.

F. C. Tilney.

FORTHCOMING EXHIBITIONS.

June 1 to 30.—Royal Photographic Society. Prints by Pirie Macdonald, of New York. Open daily from 11 to 5 p.m., 35, Ruasell Square, London, W.C.1.

August 26 to September 9.—Toronto Camera Club. Latest date for entries, July 22. Secretary, J. H. Mackay, Toronto Camera Club, 2, Gould Street, Toronto, Canada.

September 9 to October 7.—London Salon of Photography. Latest date for entries, August 30. Particulars from the Hon. Secretary, London Salon of Photography, 5a, Pall Mall East, London, S.W.1.

September 11 to 15.—Professional Photographers' Association, Princes Galleries, Piccadilly, London, W. (Trade and Professional). Hon. Secretary, Richard N. Speaight, 157, New Bond Street, London, W.1. Also foreign invitation loan exhibition of professional portraiture. Hon. Secretary, Marcus Adams, 43, Dover Street, London, W.1. Latest day for entries and exhibits, August 31.

September 18 to October 28.—Royal Photographic Society Annual Exhibition. Latest date for Entries, August 25 (carrier); August 26 (hand). Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications May 22 to 27:—

Stereoscopy.—No. 14,755. Method of producing stereoscopic pictures. P. Brandt.

The following complete specifications are open to public inspection before acceptance:—

Colour Process.—No. 180,292.—Process for converting silver prints into colour pictures. Akt.-Ges. für Anilin-Fabrikation.

Coloured Pictures.—No. 180,323. Support provided with a coating sensitive to light for the production of coloured pictures. Dr. S. Schapovaloff.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

Iconta.—No. 423,292. Optical, photographic, cinematographic and projection apparatus, included in class 8. Ica Aktiengesellschaft, Schandauerstrasse 72-80, Dresden, Germany, manufacturera. February 10, 1922.

Brierley (Camera Design).—No. 423,880. Photographs, photographic mounts, included in class 39, and stationery. John Hope Brierley, 19, Oxford Road, Altrincham, photographer. March 1, 1922.

Photoy.—No. 418,827. Photographic apparatus included in class 8. Harold McLean, 12, Burns Road, Fleetwood, Lancashire, photographer, and Walter Henry Utley Morley, 1, Preston Street, Fleetwood, Lancashire, shipbroker. September 24, 1921.

Devalaprint.—No. 422,727. Chemical substances for use in photography. Gerald Arthur Morris, 24, High Street, Rochester, manufacturer. January 25, 1922.

MARKS PLACED ON THE REGISTER.

The following marks have been placed on the register:—

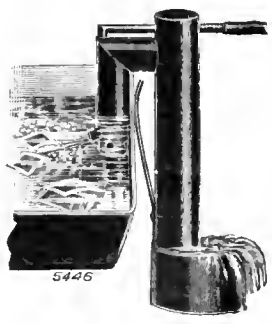
Velox (Design).—No. 421,046. Photographic papers. Kodak, Ltd., Kodak House, Kingsway, London, W.C.2, dealers in photographic materials.

Velox (Two Designs).—No. 421,423 Photographic papers. Kodak, Ltd., Kodak House, Kingsway, London, E.C.2, dealers in photographic materials

New Apparatus.

The Ensign Water Circulator. Made by Houghtons, Ltd., 88-89, High Holborn, London, W.C.1.

Those who have attended meetings of the Royal Photographic Society know the mental originality and manual dexterity of Mr. K. C. D. Hickman, who is the inventor of this appliance for the washing of negatives and prints. The "Circulator" is a piece of apparatus essentially different in principle and construction from the numerous washers which have come upon the market. It is an accessory for attachment to a dish or any approximately straight-sided and shallow vessel, which performs two distinct functions. It delivers the water into the vessel in a somewhat violent manner, and it also siphons it out again as fast as it enters. In his recent paper on the washing of plates and prints before the Royal Photographic Society, Mr. Hickman showed the special merit of an


5446


5447

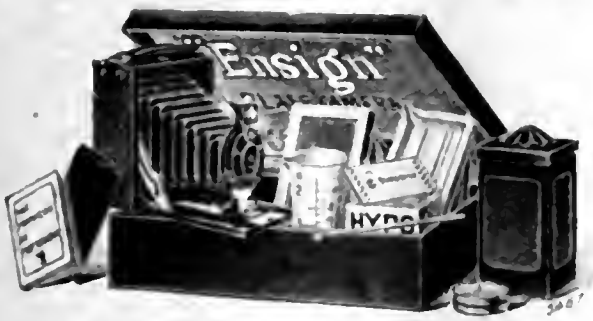
active movement of the supply of water in the removal of hypo from plates or prints. The "circulator" is an apparatus embodying the features which Mr. Hickman's scientific measurements showed to be highly advantageous for effective washing. Our own tests of the appliance, although not nearly so exact or exhaustive as those described in Mr. Hickman's paper, fully convince us of the efficiency of his "circulator." In the first place when the appliance is fixed to the side of a developing dish, as

shown in the drawing, and the rubber tube connected to the water supply, a most active circulation of water is produced in the dish on turning on the tap. We filled a dish with dark permanganate solution. On setting the circulator in operation every trace of the permanganate colour was removed in less than a minute. Without touching the tap we disconnected the rubber tube, refilled the dish with permanganate solution, of the same strength as that previously used, and let the open stream of water run into it. From two or three minutes were required to get rid of the permanganate colour, thus showing, by a rough and ready test, the much greater efficiency of the appliance over the time-honoured method of allowing water to run directly into dishes containing negatives or prints.

Further tests were made by staining fixed out plates with dye and comparing the times required for removal of the dye (with the same water consumption) when using the circulator, and when employing water straight from the tap. In these circumstances, which represent the conditions in the removal of hypo, the circulator showed to still better advantage in comparison with the open tap than in the test with permanganate.

The circulator is, in fact, a most ingenious and scientific combination of a water delivery nozzle which spreads the water supply in all directions in a dish and a kind of exhaust pump which is continuously drawing off the delivered water from near the bottom of the dish. In using it, it is of course necessary that the dish stands in a sink or in some other place which allows of the water passing away. The apparatus is supplied in two models, one of solid brass, price 27s. 6d., and the other of Duro glass, price 8s. 6d. Without question the apparatus is the most efficient accessory for the washing of prints in ordinary dishes which has yet been produced.

Ensign Plate Camera Outfits.—Messrs. Houghtons send us one of the eight outfits which they have placed upon the market specially in connection with the £3,000 competition for photographs from negatives on dry-plates. Each outfit includes a dark-room lamp, printing frame, dishes, measure and a supply of chemicals, together with the camera itself, which may be one of the magazine pattern or a folding model. The No. 1 outfit, including a 3½ x 2½ Ensign-Mascot magazine camera, costs 18s. 6d.,



whilst the No. 8, which is the one sent to us, provides an "Ensign-Klito" quarter-plate camera with f/8 lens, time and instantaneous shutter, focussing scale, folding brilliant finder and two single metal plate-holders, price £3 2s. 6d. The outfits are attractively boxed, and the opportunity to purchase the requisites for a beginning with a camera in this form will no doubt serve to make recruits for the competition and for photography.

Business away from the Studio.—Those who may not realise the great amount of portrait business to be got, particularly during the summer months, by going after sitters instead of waiting for them to come to the studio, should on no account miss reading an 8-page leaflet which describes the experience of a portrait photographer in seeking these new avenues for sitters, and, in the sequel, trebling his earnings. The booklet is issued by Messrs. Sands, Hunter & Co., 37, Bedford Street, Strand, London, W.C.2, and will be sent to any *bona fide* professional photographer free on application.

Photographers on Margate Beach.—We learn from the local papers that £320 was paid last week for the rights of taking photographs on Margate beach during the present season.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Monday, June 12.

Southampton Camera Club. Evening Outing.
Wallasey Amateur P.S. "Focussing." W. Hayes.

Tuesday, June 13.

R.P.S. "Matt Surface Plates." F. T. Usher (Messrs. Elliott & Sons, Ltd.).
Bournemouth Camera Club. "Transferotype Process." A. B. Snell.
Exeter Camera Club. Exhibition. Portfolio by F. Judge.
Hackney P.S. "Portraiture Without a Studio." S. Woodhouse.
Manchester A.P.A. "Romantic in Landscape." F. C. Tilney.

Wednesday, June 14.

Dennistoun Amateur P.A. Criticism of Outing Prints.
Rochdale Amateur P.A. "Lighting Effects in Studio."

Thursday, June 15.

Hackney Phot. Soc. Outing—St. Albans to Harpenden.
Hammersmith Hampshire House Phot. Soc. "Exposure and Development." M. O. Dell.

Friday, June 16.

R.P.S. Pictorial Group Meeting. "The Final Support in Carbon Printing." A. C. Braham F.R.P.S.

Saturday, June 17.

Edge Hill Camera Club. Outing to Woodchurch and Irby.
Hackney Phot. Soc. Annual Sports.
Sheffield Phot. Soc. Outing to Ford and Povey.
South Glasgow Camera Club. Outing to Kilbarchan.
Wallasey Amateur Phot. Soc. Outing to Manchester.

CROYDON CAMERA CLUB.

A "Print Display" brought the formal session to a close last week. In point of numbers the prints were poor indeed; in quality, there were some good things on the walls, including three Carbro enlargements, fine technically and pictorially, by the hard-working president, Mr. John Keane. If it had not been for him the "display" would have chiefly displayed the wall-paper.

The criticisms were interesting, mainly in showing the different standpoints taken by the artist, as represented by Mr. Handel Lucas, and by the photographic pictorialist, as represented by Mr. Harpur, whose conception of Art has always been kept within exceedingly convenient limits, purely due to the fact that beyond the art of the camera, other aspects have never interested him at all.

Despite these limitations, it cannot be gainsaid that for the budding pictorialist Mr. Harpur, as contrasted with Mr. Lucas, is the more useful of the two. The conventionally tasteful laws of arrangement or composition (whichever term is preferred) are fully understood by Mr. Harpur, and he can give sound advice on same lines in tuning-up to exhibition standard. Any picture, however, which does not fall within the, more or less, obvious lines of approved composition is passed over in silence as unworthy of remark, provided no patent defects appear. If the contrary, the lot of a rat in the jaws of a terrier is happy by comparison.

The criticisms of the artist, Mr. Lucas, are directed in an exactly opposite direction. Rarely, if ever, does he descend from the general to the particular, even if he has personally descended from canvas to the camera, for reasons best known to himself, and welcome, indeed, are the clear indications of far bigger things, and finer conceptions, than are to be found in the usual stock-in-trade of the critic born of photography.

If Mr. Lucas finds, for instance, his pet doctrine of "visual repose" firmly rooted in a picture, then even glaring technical faults weigh but little in the balance. Consequently, a very poor photograph, judged purely by photographic standards, may be extolled, and excellent technique overlooked. But never condemnation of anything. As an ecclesiastic he would be painfully unsound on Hell.

The rest of the evening was devoted to a discussion on the weak position of the pictorial element. Certainly not for want of technical instructions, as strong fixture lists, carried through in the past by members and kind outside friends, amply prove. Some of the veteran pictorialists in the club have got tired, and all must tire eventually, but fresh blood has lamentably failed to come forward. And why? A strong endeavour is to be made to find out, and apply the remedy.

Commercial & Legal Intelligence.

LEGAL NOTICES.—Notice is given of the dissolution, by mutual consent, of the partnership between Herman Matz and Mayer Liebermann, carrying on business as photographic printers and enlargers, at 45/47, Cheetham Hill Road, Manchester, under the style of Progress Art Studios. All debts due to and owing by the late firm will be received and paid by Mayer Liebermann.

THE PUBLIC EXAMINATION of Albert Young (trading as Fradelle & Young) was held at the London Bankruptcy Court on May 30, before Mr. Registrar Mellor. The receiving order was made on March 16, 1922, on a creditor's petition, the act of bankruptcy being the failure of the debtor to comply before February 3 with the requirements of a bankruptcy notice. The Official Receiver, in his observations on the case, reported that the debtor, at the age of 13, entered the employment of Mr. Fradelle, photographer, of Regent Street, by whom he was employed until the latter's death in 1884. He then, with a capital of about £50, commenced a similar business on his own account at 17 Regent Street, W., and continued it for about three years. About the end of 1885 he purchased his late employer's business at 246 Regent Street for £1,000, and carried on that business under the style of Fradelle & Young, until the lease expired in 1897, when he removed to 283, Regent Street, W., and about 1915, in consequence of a serious illness and bad trade owing to the war, he closed the business. About April, 1917, he took a shop at 37, High Street, Notting Hill Gate, W., and recommenced business as a photographer. In June, 1921, he removed to 41, Museum Street, W., and his business was chiefly taking group photographs of banquets. He attributed his insolvency to the loss of £80 in Farrow's Bank, to the removal from Notting Hill Gate to Museum Street, and to ill-health. The statement of affairs showed liabilities expected to rank amounting to £539 5s. 11d., and net assets estimated to produce £96 14s. 4d., thus showing a deficiency of £442 11s. 7d. The public examination was concluded.

NEW COMPANIES.

CHALLENGE MANUFACTURING CO., LTD.—This private company was registered in Edinburgh, on May 24, with a capital of £18,000 in £1 shares. Objects: To carry on the business of manufacturers of and repairers of and dealers in cameras, enlarging and projection apparatus, stereoscopes, lenses, shutters, etc. The subscribers (each with one share) are: J. Johnson, junr., 51, Buchanan Drive, Cambusland, C.A.; D. B. Mungo, 173, St. Vincent Street, Glasgow, solicitor. The first directors are not named. Qualification: £100 shares. Registered office: 173, St. Vincent Street, Glasgow.

ASHBY-NOLA, LTD.—This private company was registered on May 23, with a capital of £1,000 in £1 shares. Objects: To carry on the business of commercial and art photographers, cinematographers, catalogue illustrators and printers, trade photographers and enlargers, technical and portrait photographers, magazine and trade journal illustrators, artists, designers, etc. The first directors are: R. A. Horan, 14, Edgecombe Road, S.E., photographer; H. S. Macintosh, "Deancot," Hampstead Norris, Berks, editor. Qualification: £10. Remuneration: £1 each per annum (chairman £3). Secretary: J. Casanova. Registered office: 22, Northumberland Avenue, W.C.2.

UNDERWOOD COMMERCIAL STUDIOS, LTD.—This private company was registered on May 24 with a capital of £2,000 in £1 shares (1,500 preference). Objects: To take over the business of commercial and stereoscopic photographers carried on by H. Featherstone and R. C. Levitt at Dwydia Chambers, High Holborn. The first directors are:—H. Featherstone, 11, Wilbury Avenue, Hove, Sussex; R. C. Levitt, 6, Alexandra Mansions, Cricklewood. The said H. Featherstone is permanent chairman, subject to holding 100 shares. Qualification of ordinary directors, 1 share. Remuneration as fixed by the company. Registered office: 3, Budge Row, Cannon Street, E.C.4.

AIRCO AERIALS, LTD.—This private company was registered on May 18, with a capital of £2,000 in £1 shares. Objects: to carry on the business of manufacturers of and dealers in photographic materials and apparatus, photographs, pictures, prints and other works of art, aerial, commercial and general photographers, manufacturers of aeroplanes or parts thereof, etc., in England, U.S.A., and elsewhere. The first directors are:—Capt. S. W. Hiscocks, Grove Park House, Kingsbury, Middlesex (permanent); H. A. Peters, Holmesley, 74, Finchley Lane, Hendon, N.W. Qualification: £1. Secretary: S. W. Hiscocks. Registered office: 15, Furnival Street, E.C.4.

ARTHUR HENTSCHEL STUDIOS, LTD.—This private company was registered on May 24, with a capital of £600 in £1 shares. Objects: To acquire the undertaking of Ellen E. Butcher and Carl Hentschel, and to carry on the business of proprietors and producers of illustrations, engravers, printers, lithographers, photographic printers, advertising agents, etc. The first directors are:—Ellen E. Butcher, 16, Casella Road, New Cross Gate, S.E.14, secretary; Carl Hentschel, 70, Wynnstay Gardens, W.8, photo-engraver; Leonard Hewland, 38, St. Ann's Chambers, E.C.4, secretary. Qualification (except first directors): £50. Remuneration: 10 guineas each per annum (chairman 20 guineas). Secretary: Ellen E. Butcher. Registered office: 90, High Holborn, W.C.1.

News and Notes.

WILLESDEN PHOTOGRAPHIC SOCIETY.—Mr. H. F. James, 54, Nicoll Road, London, N.W.10, has been appointed hon. secretary.

CAMERA HOUSE JOURNAL.—The June issue of Messrs. Butcher's house organ contains particulars of the latest seasonable goods, including the series of Carbine, Cameo and Klimax cameras fitted with *f*/4.5 lenses.

ENSIGN MESSENGER.—Dealers will find particulars of many new goods and other trade announcements in the current issue of the "Ensign Messenger," just issued by Messrs. Houghtons, 88-89, High Holborn, Lonodon, W.C.1.

ROYAL PHOTOGRAPHIC SOCIETY.—At a recent meeting of the Council 19 applications for the Fellowship were considered. The following members were elected:—Olaf Bloch, J. A. Lomax, J. Manby, B. V. Storr, F. C. Toy and Oswald J. Wilkinson.

THE TRAILL-TAYLOR LECTURE.—The twenty-fifth annual Traill-Taylor Memorial lecture will be delivered at the Royal Photographic Society, on October 10, by Dr. Reginald S. Clay, who will take as his subject "The Development of the Photographic Lens from the Historical Point of View."

CITY SALE AND EXCHANGE.—A new branch, making seven in all, has just been opened by the City Sale and Exchange at 52, Cheapside, London, E.C.2, within two doors of Bow Church. A full stock of both professional and amateur requisites, new and second-hand, will be kept at this branch, which will be under the management of Mr. Hume.

THE LATE J. CRUWYS RICHARDS.—We much regret to hear of the death of Mr. J. Cruwys Richards, for many years a leading member of the Birmingham Photographic Society. By profession a designer of stained glass, Mr. Richards had the true artistic temperament, and took a great practical interest in the early movement in pictorial photography. He was one of the most successful exponents in this country of the gum-bichromate process, and was the author of a manual of this process entitled, "Practical Gum-Bichromate."

£3,000 COMPETITION.—No. 2 of the Trade Bulletin, dealing with the activities of the All-British competition, in which £3,000 in prizes is to be awarded for photographs taken from negatives on plates, gives particulars of the latest literature which is being issued by the promoters in the form of show-cards, window bills and posters, poster stamps and stereos for use in local newspaper advertising. It is announced that the following have consented to act as judges of the competition:—Sir William Orpen, Mr. George Robey, Mr. Gordon Selfridge, the Editor of "The

Graphic," and Mr. W. L. F. Wastell. All particulars of the competition are obtainable from the headquarters at 4, Oxford Street, London, W.1. The first round of the competition closes on June 30.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE COSTING OF STUDIO PORTRAITS.

To the Editors.

Gentlemen,—

Pelham Swinton is a very good man.
He tries to teach us all he can.
But if we go by the costings in his book,
Our clients would be afraid to have their photos took.

LAWLEY BROS.

Gainsborough Studio, Penzance,
May 29

We forwarded the above criticism to our contributor. His reply is as follows:—

My confrères, having known the throes
Of threading my entangled prose,
Reply in lines which do not scan
As vengeance on a nervous man.

I have no passion to upset
The value of the Cabinet,
Nor yet restrain my friends in Art
From charging lower for the Carte;

But factors which a cost enhance
Vary with the circumstance,
And what is guineas in the town
Is in the village half-a-crown.

My critics' costs must be below
Those of a West-End studio;
And hence their fees must show a state
Appropriately moderate,
Lest customers should look askance
Upon fresh Pirates of Penzance;

Or—in plain English—they must go by their own costs, and not by mine.

PELHAM SWINTON.

June 5.

SYSTEM IN HALF-TONE OPERATING.

To the Editors

Gentlemen,—Mr. Corkett, director of the Pictorial Machinery, Ltd., 7, Farringdon Road, has called my attention to an article printed in the March 31, 1922, issue of the "British Journal of Photography." This article was written by Mr. E. A. Bierman, F.R.P.S., and the subject was "System in half-tone operating."

In paragraph 3 Mr. Bierman states that any system of half-tone photography that does not permit of the making of half-tone negatives from any given copy and extension, and with all screen rulings with the same stop and exposure time, is a failure. This paragraph is not in his exact words, but it does express his thoughts as best I could interpret them.

The Douthitt system of making half-tone negatives is based on the optical law that light varies as to the square of the distance, together with the physical law, that any opening double the diameter of a known opening has four times the area. As the areas of the screen openings vary according to the screen rulings, and as the amount of light passing through these screen openings is in proportion to the size of these openings, it is apparent that we must set the screen in front of the sensitive plate according to these optical laws if we expect to obtain negatives with identical tone gradation of the copy. The screen must be set so that not only good dense dots are formed on the plate, but that also the tone gradation of the copy is retained, or so the operator can control the tone gradations, and thereby improve such copies as do not make a pleasing picture.

The screen separations listed in "Penroses Annual" are optically correct, and are the only ones that enable the operator to reproduce the tonal value of the copies. You will, of course, understand that we do not under all conditions and circumstances strictly adhere to the screen separations listed, because we have found that for certain classes of negative making, such as for the offset process, or for newspaper work that is to be stereotyped, the screen separation has to be varied to meet the needs of the type of work being done. I do, however, contend, and can prove in practice, that for any type of negative with any screen, the screen separations have to vary on a 4 to 1 ratio, if identical tonal results are to be obtained.

When making half-tone exposures at a certain extension the constant factors are:—

Screen opening.
Extension.

Variable factors are:—
Screen separation.
Stop diameter.
Exposure time.
Intensity of illumination on copy.

The screen opening and extension are really constant factors, while the screen separation and stop diameter are only variable according to the type of negative desired. This leaves only the exposure time and intensity of illumination as real variables. Heretofore we have changed the exposure time for the different screen rulings, but there is no reason why the exposure time cannot be constant if the intensity of the illumination on the copy is varied for the various screens.

We will take, for example, a condition where the lights are placed 50 inches from the copy, and the exposure time is correct for the 150 screen. The light distance for some of the other screens would be as follows:

Screen.	Light-distance.
150	50 inches
120	40 ,,
100	33 ,,
75	25 ,,

By changing the intensity of the illumination on the copy we are enabled to follow all optical laws, as to screen, separation, etc., obtain negatives of identical tone gradation, and keep the exposure time constant for any screen.

In the last sentence of paragraph 5 Mr. Bierman states: "The only possible way to obtain correct gradation in a screen negative is by the use of only one stop." This is correct only to a certain point. Due to the wet plate being a highly blue-sensitive photographic medium, and as considerable copy is received for reproduction that is quite blue, it is apparent that the copy will photograph lighter than it appears to the eye. In cases of this kind it is necessary to use more than one stop, so as to overcome the defects of the colour sensitiveness of the wet plate. On the other hand, when the copy is a true grey scale, and the tones will photograph on a wet plate in the same value as the eye sees them a one-stop exposure is all that is necessary.

I have found that the same optical laws apply to all half-tone photography irrespective of the photographic medium, wet plate, dry plate, or orthochromatic emulsion; the apparent deviations from these laws being caused by type of copy being photographed contrasty or flat, and the character of the photographic medium. Take a "Solio" print which is opposite in colour sensitiveness to the wet plate, and a one-stop exposure will prove very satisfactory, while if the copy is a retouched one in which the artist has used considerable pigment that has a bluish cast, a one-stop exposure will not always prove satisfactory. In colour separation negative-making direct on dry plates the one-stop exposure is correct, because the

colour filter and the colour sensitiveness of the plate are co-ordinated. The same is true of collodion emulsion.

In defence of the Douthitt system I will only state that it has been our aim to code all the optical laws pertaining to half-tone photography in such a manner the operator can readily understand the fundamental principles: install the necessary fittings on the camera and lens to enable him to use these laws without any calculations on his part, and, lastly, to assure that he will produce uniform negative on any screen at any bellows extension.—Very truly yours,

(Signed) RALPH GRENELL,
Manager,
Douthitt Diaphragm-Control Corp.

April 19, 1922

THE PHOTOGRAPHIC CONVENTION.

To the Editors.

Gentlemen,—In your programme for the Convention you state that I am to lecture during the week. Although I had the honour of an invitation to do so, I explained to Mr. G. B. Clifton that it was impossilbe for me to attend. I hasten to correct the error so that those who are looking forward to a pleasant time may be under no apprehension that I am going to lecture at them.—Yours sincerely,

June 2, 1922. W. L. F. WASTELL.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

W. B.—The business of Mr. Moore is now carried on as the Thurlow Manufacturing Co., 58, Thurlow Street, Walworth, London, S.E.17.

F. A.—For beach work, groups or single subjects, where the camera has not to be carried about very much, a 5 x 4 or half-plate reflex would be a very good choice. We would advise you not to get a lens of larger aperture than about *f*/6. For the half-plate reflex a focal length of 8 or 9 ins. would be suitable The reflex is not at all a suitable camera for architecture, as it is very awkward in use on a stand, and usually has not the rise of front required in architectural photography, and never a swing back.

H. B.—(1) As you are likely to have sun upon the glass, we think a greyish green or a neutral grey would be the most suitable colour for the walls. (2) A plain linoleum will be the most useful, as it will serve with indoor or outdoor backgrounds. A large rug or small carpet square can be used with the latter if desired, and will add to the appearance of the studio. (3) You cannot do better than fix white nainsook curtains, as described in "The Portrait Studio." All the glass should be covered with these, and the black blinds used while the sun is on the glass.

H. S.—The 5-in. Dallmeyer would, we think, work better with the 10-in. lens than with the 7¾. There would be no loss of rapidity for the same equivalent focal length, as the 10-in. primary image, being larger than that of the 7¾, would require less magnification. We think that there is an advantage in the Dallmeyer double negative; especially at low magnifications, it gives a better field and less distortion, while its large diameter enables a larger plate to be covered; with a "back focus" from the negative lens the 10-in. positive and 5-in. negative should cover a half-plate with a magnification of three diameters, and an intensity of *f*/22 at full aperture.

J. D.—We do not know the apparatus you mention, but presume it is one in which the negative is illuminated by diffused daylight. There would be no objection to fitting a condenser for the use of the Fullolite electric lamp, but although this lamp is considerably diffused it would still be necessary, we think, to vary the position of the lamp according to the degree of enlargement in order to get uniform illumination on the easel. Apart from this adjustment you should be able to use the camera according to the scale provided for use with daylight, but it is also to be borne in mind that some lenses which work exactly to focus with daylight do not do so with an electric light. But you could easily find out for yourself if an enlargement which is sharply focussed yields as sharp a picture on the bromide paper.

C. W.—We do not understand what you mean by "the extra focal distance of a cinematograph lens," and have never heard of the formula which you give. But as you do not say what the symbols represent, we may perhaps not fully understand your question. We understand "extra focal distance" to mean the distance of an object which is obtained in focus with a given lens, less one focal length of that lens. In projection the lantern slide or film is, of course, the object. The formula for the "extra focal distance" in these circumstances is the focal length of the lens divided by the number of times of enlargement, that is to say it is usually a comparatively small fraction of an inch in excess of the focal length. If, on the other hand, you define "extra focal distance" as the distance of the projection lens from the screen, then the "extra focal distance" is equal to the focal length multiplied by the number of times of enlargement.

O. R.—(1) To illuminate the white background the glass must extend to the extreme end of the studio. You must light your sitter independently of the light falling upon the background. (2) We do not think this necessary or desirable. (3) The arrangement for specimens is quite good. You do not need any light lower than 4 ft. from the floor. (4) In view of the probable lengthening of the studio we should advise you to have 12 ft. run of glass at least, so that you will be able to illuminate groups fairly evenly. We take it that you only intend to work from one end of the studio. (5) The angle of the roof has little effect upon the lighting. The studio will look better, and the construction be probably stronger if you have the two sides of equal pitch, say 45 deg. (6) No difference in colour is needed for using panchromatic plates. (7) White inside, and outside, too, if possible. (8) No. (9) We do not think that this matters very much if the proposed dark-room is at the dark end. The side farthest from the glass would probably be the better. (10) The Aldis 8-in. would be a very suitable lens for full length cabinets or postcard work generally, but for large cabinet heads you should use an 11-in. or 12-in. lens if possible. Most photographers use a 16-in. lens for these. The 8-in. Aldis would be excellent for enlarging.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3241. Vol. LXIX. FRIDAY, JUNE 16, 1922. Price Fourpence.

Contents.

SUMMARY.

Mr. Raymond E. Crowther contributes an article describing the new desensitisers which have been worked out by Dr. E. König, and which have been named pinakryptol and pinakryptol green. These desensitisers are at least as effective as phenosafranine, and are free from staining tendency. Pinakryptol has a much smaller effect than either phenosafranine or pinakryptol green on the Watkins factor of a hydroquinone developer. (P. 351.)

In a leading article we refer to the chief conditions which require to be observed in the use of the customary process of sulphide toning, and add some hints on the method of toning with liver of sulphur. (P. 351.)

The further portion of Mr. F. F. Renwick's review of recent progress in photographic manufacture and research deals with colour photography, colour sensitisers and desensitisers, development, radiography and emulsions. (P. 354.)

Dr. O. Mente has described a very ingenious method of copying water-marks in paper. A sheet of bromide or gaslight paper is uniformly exposed, developed, fixed, washed and bleached in mercury bichloride. It is exposed through the paper to ammonia vapour, the design of the water-mark being reproduced by the differential penetration of the ammonia through the different thicknesses of paper forming the water-mark. (P. 353.)

A cause of imperfect fixation, which is sometimes overlooked, is the dilution of the hypo bath which results from the insertion and withdrawal of prints without draining. (P. 350.)

Mr. A. H. Hall recommends a bleacher of potass ammonium chromate, or ammonium bichromate, as free from the objection of giving yellowish whites in the re-development of prints on warm-tone bromide papers for improvement of their colour. (P. 363.)

At the Royal Photographic Society, on Tuesday evening last, Mr. F. T. Usher showed the remarkable non-halative properties of the new "Matt Surface" plates introduced by Messrs. Elliott & Sons, Ltd. (P. 361.)

A method of making collotype plates from negatives by using the ordinary process of mercury intensification is the subject of a recent patent by M. de 'Sperati, who also has patented a process for making collotype plates on celluloid. (P. 357.)

A further patent of Kodak, Ltd., for a vertical self focussing enlarger will be found under "Patent News." (P. 358.)

Some remarkable snapshots by artificial light, taken on plates which had been extra-sensitised, have been published by the French Photographic Society. (P. 349.)

A handy method of keeping miscellaneous small articles where they can be found in an instant is the subject of a paragraph on page 350.

The method of Reichel for toning P.O.P. prints red may be recalled in reference to variations in gold toning. (P. 350.)

EX CATHEDRA.

Ultra-Sensitising. In his "Paris Notes" a few weeks ago M. Clerc alluded to the method of extra-sensitising of Autochrome plates worked out by M. Monpillard about a year before the war and only recently disclosed. The process consists essentially in the addition of a solution of silver chloride in ammonia to the mixture of the colour-sensitising dyes. The current issue of the Bulletin of the French Photographic Society contains a long paper on the subject by M. L. Gimpel, who was a collaborator of M. Monpillard in the practical employment of the process. Apart from the importance of the method in permitting of hand-camera exposures on Autochrome plates, other than Autochrome workers will read with more than ordinary interest the description of M. Gimpel's success with ordinary plates extra-sensitised by the Monpillard method. Several photographs from negatives taken with plates treated in this way are reproduced, among them a scene in a bar on a Parisian boulevard lighted only by mercury-vapour lamps. At the aperture of *f*/4 this plate received an exposure of a quarter of a second with the camera held in the hand. We have in preparation a full translation of M. Gimpel's paper, which we expect to be able to publish within the next week or two.

* * *

Desensitising. The way in which the process of desensitising with phenosafranine has come to the front as new and useful practice in negative-making provides an interesting object lesson in the evolution of photographic methods. For desensitising, as a process, is by no means new. The literature of the past twenty or thirty years contains many papers on it; and in that rich yet arid work, "Investigations on the Theory of Photographic Processes," by Sheppard & Mees, the properties of mineral oxidising substances as desensitising agents are the subject of detailed notice. Had these properties been regarded from a different angle, desensitising as a practical process would, no doubt, have come years ago. But by the above investigators as well as by Vidal, Sterry and others the desensitising of an exposed plate was considered solely in relation to the still elusive problem of the nature of the latent image. The convenience in practical work of a solution which partially destroyed the sensitiveness of an emulsion whilst leaving the latent image intact, evidently did not occur to these experimenters, intent on the infinitely more fundamental object. The two-fold moral of the incident is that the practically minded must study the work of the scientific people for possible applications of it not contemplated by the latter, who also, as far as possible, should describe their experimental results in plain language whatever technicalties they may admit into their discussion of them.

Red Tones on P.O.P. The production of prints of distinctive warm tones by means of gold salts is one of the branches of print making which has been neglected of late years, as a result, no doubt, of the favour bestowed on development papers and on sulphide toning and its variations. The only process which may be said to have secured a measure of popularity is that in which a sulphide-toned print is toned in a gold-sulphocyanide bath, yielding an image of red chalk to crimson colour. Nevertheless, the great variations in the colour of gold, according to the state of division of the metal, justifies the belief that experiment by those who have specialised in colloid chemistry should result in useful toning processes of this kind. In this connection it may be interesting to recall the gold toning which was employed for the making of the red component of a three-colour print according to a process patented by Reichel in 1903. A P.O.P. print was toned in a bath containing gold sulphocyanide, sodium iodide and potassium carbonate. We have still in our mind the excellence of some specimens of the Reichel three-colour process, which, however, like many another of the pre-Autochrome days, did not come to a commercial stage, but we never saw the component images separately. According to the specification, strontium or magnesium salts were necessary constituents of the P.O.P. emulsion.

* * *

Workroom Odds and Ends. The admirable maxim that there should be a place for everything and that everything should be in its place is one which cannot be too strictly applied to the photographic workroom, in which there is a tendency for odds and ends to accumulate in a muddle in drawers, and for much time to be lost when some particular item is wanted quickly. Here is the opportunity for making really good use of empty plate boxes, or at any rate of those which are of moderate size, such as quarter-plate or 5 x 4. From dealers in office requisites there can be bought "drawer boxes," a very good make of which is Stone's. These consist of a deep drawer sliding in an open-fronted casing. The boxes are made in a whole series of sizes, so that one can be chosen to take conveniently seven or eight of the empty plate boxes, placed on their ends one behind another. To the bottom of each plate box is glued a stout flap, serving to lift the box from its place, whilst a label is fixed to one end of the cover of each box and marked with the contents. By this arrangement, several drawer boxes provide storage for a score or more of various odds and ends, such as print clips, lens caps, flanges, diaphragms, camera screws, corks, glass stoppers, adhesive labels, and even such little things of workroom utility as tap washers and electric fuse wire. The means for finding any one of these things in an instant saves a good deal of time in the course of a year.

* * *

Hypo Strength and Economy. Although it is an unwise policy from every point of view to be sparing in the use of hypo in the making of negatives and prints, yet there are ways of wasting hypo which, perhaps, are unsuspected by many photographers. It is imagined that the mere use of plenty of hypo solution necessarily implies that ample provision is being made for efficient fixation of prints. Nevertheless, the manner in which prints are handled may do much towards wasting hypo, and, what is worse, creating a false impression that all is well as regards fixation. We have often seen an operator in a printing room transferring prints from the developer to the fixing bath without a pause, so that the latter is continuously diluted by the developer, or by the wash water, in the case in which an intermediate washing is given between developing and fixing. It is scarcely realised to what a considerable degree the hypo solution is reduced in strength by this practice. The amount of developer or water conveyed into the fixing bath is not noticed, for the reason that, in removing prints from the fixer the same procedure is adopted, a considerable quantity of hypo being removed through omission to allow each print to drain before transferring it to the wash water. Thus, in the course of a day's continuous work, the fixing bath can become greatly reduced in strength, not as the result of performing its proper work in dissolving the surplus emulsion, but through physical transference of the hypo into the washing tank. As a result, the hypo bath comes into a weakened condition, in which it is liable to produce prints which within a little time will show the brownish stains characteristic of imperfect fixation.

SULPHIDE TONING.

At a recent meeting of the North Middlesex Photographic Society the pros and cons of sulphide toning formed the subject of discussion, and upon a vote being taken a majority pronounced against the process, the opinion being expressed that untoned prints upon "warm black" papers, with either a white or cream base, were better suited for good pictorial work.

Sulphide toning, that is to say the bleaching of a print and the subsequent darkening of it in a solution of sulphide of soda or similar salt, appears to be a simple matter, but many points have to be observed if entirely satisfactory results are to be obtained. For while a small proportion of sulphide-toned prints leave nothing to be desired, in a much larger number of cases the result is to spoil good black and white prints. Leaving out the question of colour, the greatest faults are a clogging of the shadow details, which sometimes causes a semi-bronzed appearance, and a general degradation of the high-lights. Prints which are to be toned must be of a much better quality than is required for black and white, since the image must be sufficiently vigorous to give a good colour, but must not be in the least heavy in the shadows. To obtain this result a good negative is necessary, as it is not allowable to compensate for lack or excess of contrast by such dodging in exposure and development as would give satisfactory results with untoned prints. A good colour can only be obtained by giving fairly full development; the poor stale mustard colours so often seen result from a thin image which, in turn, may be due either to the use of a weak negative (one not allowing sufficient exposure to be given to the shadows before the lights are printed through) or to a dense or hard negative which requires a long exposure to penetrate the high-lights and a short development to avoid loss of shadow detail. It is not difficult to judge by inspection of a black print whether it will tone satisfactorily or not; a suitable one looks clear and bright by reflected light and almost equally vigorous by transmitted light.

Other causes of poor tones and unevenness are imperfect fixation, either by reason of too short an immersion in the hypo bath or the use of a solution heavily charged with silver. In either case the silver salt remaining, either evenly all over the paper, or unevenly by reason of the prints sticking together, darkens upon immersion in the sulphide bath, and gives a cream or light brown tint over the high-lights.

Even if fixation be thorough, the prints will suffer if any trace of hypo be left in them before bleaching. The

bleaching solution, being largely composed of potassium ferricyanide, forms Farmer's reducer with the hypo, reducing the image either evenly or locally to such an extent that it becomes too weak to give a rich tone. Carefully-made prints, which are rather too weak to give a good colour, should always have a preliminary immersion in the sulphide solution before bleaching, as this to a great extent avoids the appearance of the objectionable foxy colour.

Those who are not satisfied with the two-stage method of toning will do well to adopt a single-solution method, such as hypo-alum or the simpler one of liver of sulphur. The former is rather troublesome for the worker whose space is limited, and the "liver" method is therefore recommended. The tones obtained with it are a rich, warm brown, more nearly resembling the "standard brown" of the carbon printer than a true sepia, but even with weak prints the colour is good, although lacking in richness. One great advantage is that a great variety of tones can be obtained at will. The time of immersion influences the colour exactly as in toning printing-out papers; the only difference is that the longer the immersion the warmer the colour, a very short immersion giving a warm black, while longer ones give various shades of purplish brown till a warm sepia is reached. It is necessary to say that the tones obtained vary greatly with different brands of paper, as does also the speed of toning. In a recent experiment it was found that with two prints on different papers, one toned to a warm sepia suggestive of Seltona without the salt bath in less time than the other assumed a purple brown such as is obtained on the same paper with the salt bath. With a longer immersion of the purple print a good warm brown was secured.

The process is a simple one, the bath consisting of 60 grains of liver of sulphur ("potass. sulphurata") dissolved in 80 ounces of water to which about 10 minims of .880 ammonia should be added. This should be used at a temperature of 80 degs. to 100 degs. Fahr., some papers toning readily at the lower temperature. Although all papers do not need it, it is advisable to harden the prints five minutes in 10 per cent. formaline solution, giving a slight rinse before immersing in the toning solution. After toning, the prints should be washed until all odour has disappeared, and if the solution is at all turbid it is well to swab the surface with cotton wool before drying. If blisters appear, they are probably due to too sudden a change in temperature in transferring to the washing water, in which case the first rinse should be given in tepid water.

It should be noted that the tone becomes perceptibly warmer during the final washing, so that care should be taken to arrest the toning while the colour is a little cooler than is desired for the finished print. But, as is the case with all toned prints, the colour becomes colder upon drying, so that very little allowance need be made. The most important point appears to be the selection of a paper which will easily give the desired tone.

NEW DESENSITISERS.

It is somewhat more than a year since the process of desensitisation—the outcome of a long and tedious research by Dr. Lüppo Cramer—was introduced to readers of "The British Journal of Photography." The interest which has been taken in the subject throughout the world in the interim affords sufficient justification for an attempt to "report progress."

In this country the solution "Densensitol" has enabled photographers to try out development of highly sensitive plates in bright light, and so satisfy themselves of the merits of the invention. Within the last six weeks a well-known firm of plate makers has announced the manufacture of plates backed with desensitising composition, thus simplifying the application of the process and placing it at the disposal of all to whom the making up or dilution of solution constitutes "too much trouble." In France photographers have had at their disposal a choice of desensitising agents of varying efficiency, some of which do not suffer from the staining tendencies of phenosafranine. There seems to be no room for doubt—at least, as far as reduction of sensitiveness is concerned—that phenosafranine is the most efficient substance hitherto available, and its adoption by the photographic section of the Japanese Air Force is practical testimony to this contention. Anyone who has used this dye, however, must have been struck by the extraordinary staining power of even a 1 : 5,000 solution; if such a solution be employed as a desensitising bath before development it is very difficult to remove the last traces of dye from the film by simple washing, especially if the glass of the negative has been coated with a substratum of tanned gelatine in the process of manufacture. The multitude which uses film is virtually debarred from the advantages of desensitisation by phenosafranine, the two gelatine coatings of the substratum necessitating so long a washing that softening and frilling more than counterbalance the advantage of being able to manipulate the development by lamp light or candle light.

The direction of progress, therefore, clearly lay in the production of a colourless, or at least non-staining, desensitiser, and whilst, no doubt, research workers in this country have been experimenting with this end in view, their efforts have not been so successful as those of our late enemies, the Germans. This could scarcely be otherwise; for, whilst our dye manufacturers have been fully occupied in making products which were exclusively manufactured in Germany before the war—products which have been dealt with in bulk and which have been urgently required for our textile industries—the chemists of the latter country have been able to devote their research time to the investigation of the more out-of-the-way properties of hundreds of dyes and intermediates already on their shelves.

The world-renowned photo-dye chemist, Dr. König, of Hochst a/Main, who collaborated with Dr. Lüppo-Cramer in the work on phenosafranine, has continued his investigations and has discovered entirely new classes of products, which are as efficient as phenosafranine as desensitisers, and some of which are colourless. Others, though coloured, have been found to be without staining action on gelatine or on the fingers of the operator; most promising results it must be admitted, but there are at least two other properties which must be possessed by an efficient desensitiser, viz., ready solubility and non-interference with the ordinary course of development. The writer has already called attention to the fact that with certain developers phenosafranine exerts a pronounced retarding action, while with hydroquinone the characteristic pause between pouring on the developer and the appearance of the image vanishes—in fact, hydroquinone

as a developer, either after a preliminary desensitising bath of phenosafranine or as a mixed developer containing phenosafranine, behaves exactly like metol.

By the courtesy of Dr. König the writer has been enabled to test the two products which are at the moment considered the best obtainable. They have been labelled by their discoverer "Pinakryptol" and "Pinakryptol Green," and, whilst the former is a mixture of a colourless with a coloured non-staining substance, the latter is a pure green-coloured substance, almost devoid of affinity for gelatine, skin, etc. The test results are of sufficient interest perhaps to warrant publication, if for no other reason than that they indicate how near to the ideal research is bringing us.

Pinakryptol.

This is a dark greenish-grey powder, the larger proportion of which is only soluble with great difficulty even in 5,000 times its weight of warm water. As it does not appear possible to prepare a stronger solution than 1: 5,000, one must either be able to weigh out exceedingly small quantities or deal with large volumes of solution. One would naturally choose the latter method of working, and so minimise the risk of spoiling sensitive material by reason of flying specks of the dry Pinakryptol. The 1 : 5,000 solution, which is of a turbid grey-green character, can be used either as a preliminary bath—immersing the plate or film therein for not less than one minute in the dark before proceeding to development in a full red or orange light (or by candle light)—or 25 per cent. by volume of the Pinakryptol solution may be added to the usual developing solution, and the first 1½ to 2 minutes of the developing operation be conducted in a "safe" light.

Desensitising Efficiency.—The writer has only tested this desensitiser according to the former method so far, and has found that the reduction of sensitiveness with a Kodak super-speed portrait film is of the order of $\frac{1}{1,100}$; it is, therefore, of somewhere about the same efficiency as phenosafranine. Experiments with a panchromatic emulsion indicate that the Pinakryptol is at least 1⅓ times as efficient as phenosafranine in desensitising for the shorter wave-lengths (blue end of spectrum) and at least 2½ times as efficient as phenosafranine in desensitising for the red end of the spectrum.

Staining Tendency.—The almost complete lack of affinity between the small proportion of green substance which is present in Pinakryptol, and the entire absence of colour from the constituent present in the larger proportion, lead to a finished negative, even on film base, which, after five minutes' washing in running water, is quite free from stain. A marked advantage over phenosafranine is thus evinced. It will be obvious also that Pinakryptol may find application in stand development, there being no objection to prolonged immersion in a bath containing this desensitiser.

Development Effects.—These can be most conveniently stated in a tabular form, and they will therefore be given, along with those evidenced by Pinakryptol Green, at the end of this communication. It is only necessary here to point out that a retardation of development is caused by desensitising with Pinakryptol.

Pinakryptol Green.

This product comes on to the market in small, granular crystals, which exhibit a green appearance by reflected light. It has the characteristic appearance of what are commonly termed "basic" dyes. It is fairly readily soluble in water, and a 1: 500 stock solution of an intense green colour can be conveniently made up and diluted 1 : 10 for use as required.

Desensitising Efficiency.—Used as a preliminary bath 1 : 5,000 for one minute on Kodak super-speed portait film, the sensitiveness was reduced to $\frac{1}{1,500}$, it is thus a more efficient general desensitiser than either phenosafranine or Pinakryptol. Like these products it may also be combined with the developer, in which case five to ten minims of the 1 : 500 solution should be added to every fluid ounce of the developing solution and the development conducted in a safe light during the first minute. The desensitising action of Pinakryptol Green on a panchromatic emulsion is of the same order as that of phenosafranine for blue light, whilst for green, yellow and red light the depression of sensitiveness is so great that no developable image was produced in the tests made by the writer by the action of lights sufficiently strong to give pronounced effects on a phenosafranine-bathed plate.

Staining Tendency.—The colour of the 1 : 5,000 solution of this product is so intense a green that pronounced staining of the gelatine is naturally looked for; whereas, as a matter of fact, there appears to be no staining whatever, the only discoloration which is noticed when the film is removed from the developer is that due to the green solution soaked into the film. It is removed at least as readily as the fixing bath products; ten minutes' washing in running water being ample to give a colourless negative, even on N.C. film base, which is coated both back and front with gelatine. Moreover, dishes are quite unstained by the solution, which in the full red or orange light of the workroom can be most conveniently handled owing to its apparent black colour.

Development Effects.—These will now be expressed in tabular form, including, for reference, the results obtained when a 1 : 5,000 bath of phenosafranine is used as a preliminary desensitising bath. All the tests were made on super-speed portrait film, the exposure to screened electric light being the same for each section of film, which was placed in contact with an Eder-Hecht-Goldberg wedge photometer. The developers were used at a temperature of 65 deg. F., and the control film, which is designated as having been subjected to no desensitising bath, was immersed in water for the same time as the remaining films were immersed in the desensitising solutions previous to development.

Hydroquinone Developer.—

A.—Hydroquinone	1 oz.
Potass. metabisulphite	1 oz.
Potass bromide	1 oz.
Water	...to 40 ozs.
B.—Caustic potash (sticks)	2 ozs.
Water	40 ozs.

Equal volumes A and B are mixed for use.

Desensitising Bath.	Time of Appearance. Secs.	Total Time. Mins.	Total Time. Secs.	Watkins Factor.	Notes.
None ...	30	3	0	6	The four results are practically identical in amount and contrast of image.
1 : 5,000 Phenosafranine .	2	2	0	60	
1 : 5,000 Pinakryptol	12	2	36	13	
1 : 5,000 Pinakryptol Green	2	2	0	60	

Metol Hydroquinone Developer.—

Metol	15 grs.
Hydroquinone	60 grs.
Sodium sulphite (crystals) ...	1½ oz.
Sodium carbonate	1½ oz.
Potass. bromide	4 grs.
Water	...to 40 ozs.

Desensitising Bath.	Time of Appearance. Secs.	Total Time. Mins.	Total Time. Secs.	Watkins Factor.	Notes.
None ...	20	4	0	12	Normal contrast.
1 : 5,000 Phenosafranine .	20	4	0	12	Slightly weak.
1 : 5,000 Pinakryptol ...	60	4	30	4½	Slightly weak.
1 : 5,000 Pinakryptol Green	20	4	0	12	Normal contrast.

Pyro Developer.—

A.—Sodium sulphite (cryst.) ... ... 16 ozs.
Sodium carbonate (cryst.) ... 16 ozs.
Water ... ... to 80 ozs.

B.—Pyro ... ... 2 ozs.
Potass. metabisulphite ... ... ½ oz.
Water ... ... to 80 ozs.

Mix 1 volume A, 1 volume B, and 2 volumes water for use.

Desensitising Bath.	Time of Appearance. Secs.	Total Time. Mins.	Secs.	Watkins Factor.	Notes.
None ...	25	5	0	12	Normal contrast.
1 : 5,000 Phenosafranine .	12½	2	30	12	Appreciably weak
1 : 5,000 Pinakryptol ...	33	5	0	8½	Appreciably weak
1 : 5,000 Pinakryptol Green	12	2	25	12	Slightly weak; image of greenish colour.

Action on Latent Image.

The action of these desensitisers on the latent image was also investigated, and it was found that there is no destruction whatever caused by either Pinakryptol or Pinakryptol Green, even if prolonged action of the 1 : 5,000 bath is allowed. The very pronounced retardation of development caused by Pinakryptol might lead one erroneously to conclude that some destruction of the latent image is caused by this desensitiser. As a matter of fact, the "threshold" values of two negatives—one of which was developed after a given exposure without a preliminary desensitising bath and the other developed after a similar exposure, followed by two minutes' treatment with a 1 :5,000 Pinakryptol bath—are identical. There need be no misgivings, therefore, on the question of interference with the "speed" of a given plate or film by desensitisation with either of these new products. If Pinakryptol is used, it is only necessary to prolong development by something like 25 per cent. to 30 per cent. in order to obtain a negative of normal contrast. The writer, however, prefers to use Pinakryptol Green. But this is a free country, and every worker is at liberty to make his own experiments and choose for himself, for the products may be obtained from Messrs. A. Connell and Co., of Bevis Marks, London, E.C.

RAYMOND E. CROWTHER.

THE PHOTOGRAPHY OF WATERMARKS IN PAPER

[Among the subjects of exceptional difficulty which have sometimes to be undertaken by commercial photographers, and particularly by those doing work for legal purposes, are watermarks in paper, the reproduction of which is often of importance in determining the age or origin of a document. In the following article in the "Zeitschrift für wissenschaftliche photographie," Dr. O. Mente deals with this branch of work, and describes two new and ingenious methods for overcoming the great difficulties in obtaining clear reproductions of the watermarks in the case of documents which bear writing on both sides.]

In the case of documents, the paper of which has a prominent watermark, a reproduction of the latter may often be obtained of sufficient distinctness, even when there is writing on both sides, simply by making a contact print on P.O.P. or development paper. Especially by choosing a development paper of character suitable to the original which is to be copied, and also by controlling the development, comparatively good copies may be obtained in which the writing on each side of the document is little in evidence.

For example, by giving such a short exposure that the light penetrates only through the thinnest portions, namely, the watermark, of the paper, scarcely any developable effect is produced in the other parts, and a most satisfactory result may be obtained. A further means towards improving the result consists in stopping development at the moment when the watermark has been brought up, whilst other parts of the image have scarcely begun to develop. Nevertheless, by such methods as these the result is only a moderately strong image of the watermark, more or less broken up by the writing on the document. Inasmuch as many watermarks do not include minute details, these ordinary methods often suffice for recognition and reproduction of their design.

More difficult subjects of this kind are, however, often encountered, for dealing with which the writer has devised other methods which have proved satisfactory in use. Various forms of procedure may be followed. For example, the original may be mounted between two glass plates and a negative made by transmitted light, and a weak positive transparency from this latter. This transparency is then brought into register with the negative, and the combination of the two is used for contact printing or enlarging. The final result by this method is, however, not appreciably better than that by those already mentioned.

Another method is to make the negative, again by transmitted light, on paper of card thickness, or, better, on lantern emulsion coated on opal. The positive transparency from this negative is bleached with mercury bichloride or solution of iodine in potassium iodide and brought into register with the negative. The result then is that the dark lines of the writing are greatly subdued when viewing the combination (through the bleached positive transparency) by reflected light, whilst the details of the watermark come out fairly well with skilful use of the process.

But the above methods require a considerable dexterity and judgment. Moreover, it is almost necessary to employ the wet collodion process on account of the facility with which negatives and transparencies of the required character are obtained by its means. And when all has been done the result frequently falls short of expectations. It therefore seemed advisable to seek a process which could be carried out with greater ease and certainty and was applicable to those cases in which the design of the watermark was closely entangled with the writing on one or both sides of the paper.

After many experiments the writer devised a method dependent upon the lesser thickness of the paper in those parts which represent the watermark. He first experimented with a method of taking an actual cast of the watermark in plaster of Paris. A thin film of plaster of Paris was coated on a flat glass plate on which the original was laid. More plaster of Paris was applied until a mass of fair thickness was obtained and the whole was then put to dry in a warm place. As soon as dry, preferably by means of a hot plate,

the original is readily detached from the plaster of Paris, and often comes away of itself. The relief which is left may be photographed in strong side light, or may be strengthened for photographing by coating it with black lithographic ink and polishing the whole surface with the ball of the hand.

It will be understood that such a process as this does not yield very satisfactory results with watermarks in weak relief, and, moreover, it suffers from the drawback that writing which has been done with a hard pencil on a comparatively soft paper is reproduced by the casting method just as though it formed part of the watermark.

A much more more satisfactory method, which works perfectly for the most delicate watermarks, even when accompanied by heavy writing, has been worked out by the writer in conjunction with Dr. H. Francke, and depends on the diffusion of gas through parts of the paper of different thickness. It is, of course, necessary that the ink which forms the writing should not obstruct the diffusion of the gas, otherwise the process could not be expected to yield better results than those by ordinary printing. In practice it was found by some preliminary rough experiments that the ink does not impede the diffusion of the gas (ammonia) in the slightest, and hence it was necessary only to devise the most advisable form of the process. After many fruitless experiments the following method of operation was devised and was found to be extremely successful:—A sheet of ordinary development paper is given a short general exposure (to fog it slightly), developed, fixed, washed, bleached in mercury bichloride, and dried. This "sensitive" paper is used for recording the action of the ammonia gas which passes in different degrees through the document. In order to avoid treating the original with ammonia solution a piece of flat, unglazed porcelain is soaked in strong ammonia, removed from the solution and allowed to become dry on the surface by short exposure to the air. The original is laid on this plate and the bleached sheet of development paper laid on it. The ammonia, discharged evenly from the area of the impregnated plate, then passes differentially through the original and darkens the white mercury compound existing over the area of the paper. The clear image of the watermark which is produced in this way may be readily strengthened in pencil.

O. MENTE.

PHOTOGRAPHIC MATERIALS AND PROCESSES.

[REGULARLY each year the Society of Chemical Industry renders a valuable service to those connected with the manufacturing and scientific sides of photography by including in its "Annual Reports" one on photographic materials and processes. The report for the year 1921 is written by Mr. F. F. Renwick, F.I.C., whose large share in photographic research qualifies him exceptionally as a recorder of recent investigations in the technical improvement of processes of making negatives and positive prints, orthochromatics and colour photography, cinematography, and photo-mechanical processes. The report exhibits the work which obtained publication last year in its relation to previous knowledge better than any other communication which comes before the photographic industry, for which reason we endeavour to find a place for it in our pages. As regards the references to original sources of publication, it should be explained that the contraction "J" denotes the fortnightly "Journal" of the Society of Chemical Industry, in which are published abstracts of the chief papers dealing with the chemical side of practical, scientific, or industrial photography.]

(*Continued from p.* 342.)

An interesting short discussion of the various systems of colour cinematography theoretically possible, which contains some very decided expressions of opinion concerning them, is to be found in an article recently published by A. Gleichmar.[16] He rules out as unworthy of consideration all two-colour systems and states clearly but briefly the demerits and inherent difficulties of each of the methods available to experiment. An article by C. E. K. Mees in "The Photo Miniature" for July, 1921, also contains interesting expressions of opinion on the subject.

The only process of colour cinematography to come on the British market during the year is the American one "Prizma," made under W. V. D. Kelley's Patents.[17] It is a two-colour process in which the picture is composed of juxtaposed microscopic areas of orange-red and blue-green, made by dye-toning on either side of a double-coated film. A short film based on a three-colour subtractive process by S. M. de Procoudine-Gorsky[18] was exhibited privately in London last spring.

In connection with processes of staining up the positive colour records, considerable attention is being devoted to the dye-absorptive properties of the silver halides and metallic ferrocyanides,[19] while a novel property of the developed silver image forms the basis of a patent by J. H. Christensen,[20] who finds that in the presence of suitable reducing agents (*e.g.*, amidol or hydrosulphites) certain dyes are readily reduced to their leuco bases where the silver image occurs. An interesting reaction of a similar kind is described by J. I. Crabtree[21] who finds that even an ordinary acid "hypo" fixing bath can function as the reducing agent.

16. A. Gleichmar, *Phot. Ind.*, 1921, 894.
17. W. V. D. Kelley, E.P. 129,638; *Brit. J. Phot.*, 1920, 67, *Col. Suppl.*, 47; 1921, 68, *Col. Suppl.*, 18.
18. S. M. de Procoudine Gorsky, E.P. 135,171 and 168,100. See also *Brit. J. Phot.*, 1921, 68, *Col. Suppl.*, 38.
19. A. Traube, E.P. 147,005 and 147,103; *J.*, 1921, 325A, 413A. F. E. Ives, *Brit. J. Phot.*, 1921, 68, *Col. Suppl.*, 3; *J.*, 1921, 99A; *Brit. J. Phot.*, 1921, 68, 186; *J.*, 1921, 325A. L. Lobel, *Bull Soc. Franç. Phot.*, 1921, 8, 78. W. V. D. Kelley, E.P. 160,137. J. I. Crabtree, U.S.P. 1,389,742; *J.*, 1921, 791A. S. M. de Procoudine Gorsky, E.P. 168,100.
20. J. H. Christensen, E.P. 133,034; *J.*, 1921, 164A.

Colour Photography.

In a chapter of J. Plotnikow's recently published book on "Photochemistry"[22] appears the only important new suggestion of a possible method of recording colour photographically. He points out that if dyes could be made which were "fast" to the acid constituents of the atmosphere and to light except in the presence of a colourless catalytic agent, in the presence of which they change, on exposure, to stable colourless products, removal of the catalyst after printing would yield a permanent coloured image. No such combinations of dye and catalyst are, however, known at present.

Apart from this suggestion no new principle appears to have been evolved, and most of the published papers and patents are concerned either with means of overcoming well-known mechanical difficulties, or refer to special toning or dyeing operations in which one or other of the known properties of selectively hardened gelatin, or of the silver image or an insoluble salt formed from it, is employed as medium for the colour.[23]

There can now be little doubt that no process involving the use of more than one plate for negative making is likely to attract the general public. This part of the problem may be said to have been solved by such screen-plate processes as the Autochrome and Paget colour processes. They remain, however, comparatively little used, largely owing to the absence of a simple method of reproducing them in the form of coloured prints on paper. Here again it is probably safe to hazard the opinion that any system involving the making of a colour analysis of the original and a separate printing on paper from each of the three negatives so

21. J. I. Crabtree, *Brit. J. Phot.*, 1921, 68, 32; *J.*, 1921, 129A.
22. J. Plotnikow, "*Allgemeine Photochemie.*" See also *Phot. Ind.*, 1921, 6.
23. Ges. f. angew. Phot. m.b.H., G.P. 328,618; *J.*, 1921, 196A. B. Lincke and R. Kaufhold, G.P. 336,041; and see also ref. 19.

obtained would never achieve popularity. Hence all methods based on the superposition of dyed reliefs or on the transfer of dyes to paper to form the print by imbibition from three separate stained-up copies must give way to any successful method of producing the coloured paper print from a single printing plate. An interesting historical survey including some of the former processes is contained in two recent articles by E. J. Wall,[24] while in connection with the possibility of successfully reproducing screen-plate transparencies on paper from a single printing plate the patent of O. Fielitz[25] is worthy of attention.

Colour Sensitisers and Desensitisers.

While the photographic industry shares with most others the need, for tinctorial purposes, of a range of dyes which are fast to light and various chemical reagents, and which are absorbed by certain materials and not by others, it is peculiar in requiring dyes having the power to modify the normal blue-violet sensitiveness of the silver halides by conferring upon them a high degree of sensitiveness to other regions of the spectrum. Some are required to sensitise over a quite limited range of wave-lengths, others for as large a range as possible, and all are desired to operate without depressing the white-light sensitiveness of the emulsion or inducing chemical fog or other defect. The discovery and study of sensitising dyes is an almost limitless and singularly attractive field of investigation which in recent years has received considerable attention in this country in France, and the United States, instead of being left almost entirely to German chemists, as had been the case for some years before the war.

Two new methods of preparing plates highly sensitive in the ultra-violet have been described by J. Duclaux and P. Jeantet.[26] In one case the surface of an ordinary gelatino-bromide plate is coated, before exposure, with a thin film of an oil or other liquid which does not penetrate the gelatine but which fluoresces strongly in ultra-violet light. After exposure this liquid is washed off in a suitable solvent before development is proceeded with.

According to the second method, an ordinary dry plate is treated in a horizontal position with sulphuric acid of sufficient strength to dissolve the gelatine. The silver salts settle on to the glass and are washed free from gelatine and acid in a sluggish stream of water, dried, and finally protected by a thin coating of collodion before exposure. Such plates are stated to be highly sensitive to ultra-violet radiation even beyond 1900 A.U.

It is apt to be overlooked that even the fastest modern dry plates do not fully utilise the normal sensitiveness of silver bromide because of the high opacity of gelatine and of our glass lenses to short-wave ultra-violet light. With such plates as those described above it would be very interesting to investigate the possibilities of utilising as sensitisers colourless substances having absorption bands in the ultra-violet region.

Even the most satisfactory colour sensitisers known are far from enabling us to utilise the incident light-energy in other regions of the spectrum so efficiently as the undyed plate utilises the blue-violet. As a matter of practical experience it has been found extremely difficult to increase the total sensitiveness to bright daylight of a rapid dry plate by colour-sensitising it, the added sensitiveness to longer wave-lengths being always accompanied by a fall in blue-sensitiveness. That this result is not due to any direct antagonism between lights of different colours when operating simultaneously is negatived, not only by giving equal exposures in a spectograph to plates of the same batch, both undyed and dyed, and comparing the effects in the blue, but by a recent communication of F. C. Toy,[27] who finds the effects of differently-coloured lights acting together to be simply additive. At present it remains obscure why we are unable enormously to increase the sensitiveness to white light of fast emulsions by colour-sensitising them. With very slow, fine-grained emulsions it is quite easy to accomplish this, as most practical emulsion makers have long known, but the point has been emphasised very usefully, and amply illustrated, in papers, by Lüppo-Cramer[28] during the past year.

For some time two or three dyes have been known (Pinachrome Violet, Sensitol Violet) which operate without reducing, if they do not enhance, the total sensitiveness of rapid plates to white light, but they are very prone to cause fog and are otherwise difficult to handle. During the year a new and powerful green-sensitiser, said to be a basic dye of an entirely new class, has been put on the market by the firm of Meister, Lucius, u. Brüning under the name Pinaflavol. It confers sensitiveness throughout the green extending to the D (sodium) lines and shows no depression of sensitiveness in the blue-green as do dyes of the eosine class. Like those already mentioned, it has the unusual property of enhancing rather than diminishing the total sensitiveness of the plate, but unfortunately it also readily gives rise to chemical fog and shortens the useful life of plates treated with it.[29] Another dye of the same type has been examined and reported on by Lüppo-Cramer under the designation P2 showing these qualities in a still greater degree. Incidentally he makes several interesting observations on the different effects of chemical and physical development in such cases, no chemical fog being obtained by the latter method of development, and a greater relative increase of sensitiveness being found. Other papers by the same author[30] dealing with the colour-sensitising of silver iodide contain a number of curious and interesting observations.

Patents have been granted to E. Q. Adams and H. L. Haller for sensitising dyes of the dicyanine class produced by the action of alcoholic solutions of strong bases upon the alkyl iodides of lepidine.[31] Miss F. M. Hamer has prepared and systematically studied a large group of isocyanine dyestuffs containing the amino, acetylamino, or cinnamoylamino groups in all practicable positions in the molecule and has drawn conclusions concerning the influence of these groups and their positions in the molecule on sensitising properties.[32]

In a paper by W. König and O. Treichel[33] dealing with the constitution of the cyanines and isocyanines the authors abandon König's earlier view that in preparing these dyes one of the quinoline rings has suffered fission of the pyridine ring, the reason being that compounds of this type, when prepared, failed to show the characteristics of the isocyanines. The paper contains, besides, descriptions of a series of condensation products of dimetylaminobenzaldehyde, and dimethylaminocinnamaldehyde with α and γ methyl cycloammonium salts, which it would be interesting to examine for sensitising properties in view of Mills and Evans' negative result with o-aminocinnamylidenequinaldine (see *Ann. Repts.*, *6*, 116).

Confirmation of the writer's observation of red sensitiveness conferred by the action of soluble iodides upon silver bromide emulsions is forthcoming in a paper by R. B. Archey[34] and in one by S. E. Sheppard, who, however, finds the effect not to be common to all emulsions.

A very considerable amount of attention has been devoted to the study of desensitising materials which have now found a useful field of application in practical photography. Prior to Lüppo-Cramer's discovery of the utility of the safranine dyes as desensitisers which do not impair the latent image, this class of substances was regarded simply as an unmitigated nuisance to the manufacturers and users of photosensitive materials since they are of fairly widespread occurrence and readily give rise to insensitive spots and markings on their products. Lumière and Seyewetz[35] have studied a large range of dyes and other materials for desensitising properties and find Aurantia (ammonium salt) sufficiently powerful for desensitising Autochrome plates and preferable to phenosafranine on the ground of the greater ease of removing the dye afterwards. Lüppo-Cramer[36] has actively pursued the subject and concludes that desensitisers act as mild oxidising agents in preventing the formation of a latent image. As might have been expected, in view of the known depressant action of many colour-sensitisers, it has been found that phenosafranine and some other desensitisers can exert a colour-sensitising influence.[37]

24. E. J. Wall, *Brit. J. Phot.*, 1921; *68*, *Col. Suppl.*, 30, 34.
25. O. Fielitz, P.P. 175,067.
26. J. Duclaux and P. Jeantet, *J. de Physique*, 1921, *2*, 186.
27. F. C. Toy, *Proc. Roy. Soc.*, 1921, *a 100*, 109.
28. Lüppo-Cramer, *Die Phot.*, 1921, Nos. 6 and 8; *J.*, 1921, 760a. *Phot. Ind.*, 1921, 417. *Der. Phot.*, 1921, *31*, 242.
29. Lüppo-Cramer, *Der Phot.*, 1921, *31*, 281.
30. Lüppo-Cramer, *Phot. Ind.*, 1921, 611, 669; *Die Phot.*, 1921, Nos. 6 and 8; *J.*, 1921, 750a.
31. E. Q. Adams and H. L. Haller, U.S.P. 1,374,871-2; *J.*, 1921, 413a.
32. F. M. Hamer, *Chem. Soc. Trans.*, 1921, *119*, 1432; *J.*, 1921, 791a.
33. W. König and O. Treichel, *J. prakt. Chem.*, 1921; *102*, 63; *J.C.S. Abst.*, 1921, *120*, 736.
34. R. B. Archey, *Phot. J.*, 1921, *61*, 235; *J.*, 1921, 413a.
35. A. and L. Lumière and A. Seyewetz, *Brit. J. Phot.*, 1921, *68*, 362; *J.*, 1921, 529a. *Brit. J. Phot.*, 1921, *68*, *Col. Suppl.*, 29; and *Bull. Soc. Franç. Phot.*, 1921, *8*, 216; *J.*, 1921, 718a.
36. Lüppo-Cramer, *Phot. Ind.*, 1921, 259, 312, 669; *J.*, 1921, 325a. *Die Phot.*, 1921, No. 3, 1; No. 4, 18. *Phot. Rund.*, 1921, 37; *J.*, 1921, 324a.
37. Lüppo-Cramer, *Phot. Ind.*, 1921, 417

Photographic Developers and Development.

There have been no important additions to the already large assortment of available developing agents during the year. Patents have been granted to E. Kolshorn[38] for derivatives of *p*-aminophenol and its O alkyl ethers, to A. S. McDaniel and A. H. Nietz[39] for the use of diaminophenolsulphonic acid in alkaline solution, and to J. Hauff u. Co.[40] for *o*- and *p*-amino and diaminophenol and cresolsulphonic acids in alkaline solution.

W. Ermen[41] has made some interesting comparisons of the relative rates of exhaustion of a number of developers in equal concentrations, the results showing clearly that the price per ounce is a very imperfect criterion of the real cost of a developing agent when it is used economically and in quantity. In a series of articles B. T. J. Glover[42] discusses the application of the Watkins factorial method of the development of plates and papers; one of the most important points emphasised is that for bromide papers there is a certain range of correct exposures within which identical prints are obtainable by compensatory alterations in the length of development.

The important question of preserving developing solutions from atmospheric oxidation continues to receive attention, the most interesting contributions being M. J. Desalme's method[43] of preserving amidol by means of a complex stannous tartrate solution, and L. J. Bunel's method by means of lactic acid,[44] which are both fairly effective. Unfortunately they do not obviate the indelible black stain which amidol imparts to the fingernails on prolonged working with this developer.

To Lüppo-Cramer[45] are due some further interesting observations on the increased rapidity of action of quinol (hydroquinone) developers in the presence of traces of phenosafranine. He recommends this mixture as a cheap developer of the rapid class and ascribes the previously observed similar effect of mere dilution in the case of amidol and several other developing agents to the liberation of the free base by hydrolysis and its absorption by the silver halide.

The subject of chemical fog, its relation to sensitiveness, and the causes which give rise to it, is one of very great practical importance and theoretical interest. No researches specifically devoted to this subject have appeared, but incidentally a number of new circumstances in which it arises have been observed by Lüppo-Cramer.[46] The frequently expressed opinion that chemical fog is due to partial or to excessive chemical reduction of the silver halide by reducing products, formed during the hydrolysis of gelatine which occurs during ripening, may be, and probably is, one possible cause but certainly does not cover more than a small proportion of all cases. For instance, the large granules or small clots of a badly-made (granular) emulsion are always rapidly reduced in development, even in a slow almost unripened emulsion, while the writer has experience of a bromochloride emulsion boiling method) which was prone to black fog when ripened by standing for 5 minutes in boiling water, but which gave no fog if the boiling treatment was increased to 8 or 9 minutes. There seems to be much to support the idea that electrically neutral particles of silver halide are instantly reducible by a photographic developer whether embedded in a colloid vehicle or not. There are so many known ways of inducing chemical fog that it is now highly desirable to submit them to a thorough study in the hope that their ultimate causes may be reduced to a few and based on fundamental principles.

Photomechanical Processes.

In this direction no striking new development appears to have taken place apart from the "Photosculpture" process due to H. M. Edmunds already referred to, which, properly speaking, falls under this heading.

The year has been chiefly notable for the many attempts that have been made by lithographic firms to apply the three-colour process to lithography. The chief difficulty encountered has been the necessary retouching, which cannot be so readily carried out on lithographic zinc plates as it can on half-tone blocks. One method of overcoming this difficulty has been provisionally protected by A. E. Bawtree. It consists of applying to each patch of colour in the original a piece of suitably-coloured cellophane; this alters the colours of the original by an amount which corrects the change in reproduction, so that the colours as reproduced should be correct.

The old idea of impressing a grain, regular or irregular, upon a collotype plate instead of using the natural reticulation of the film, has been revived by A. R. Trist, who is using for this purpose a regular screen with fine lines. So far as this work has gone, it indicates that there is a possibility of obtaining collotype plates that are easily inked, and will give longer runs in the printing machines.

A recent paper by H. M. Cartwright[47] on the rendering of tone values by rotary photogravure is a welcome indication that modern methods of dealing with tone reproduction problems are being applied to photomechanical processes. Such studies will surely lead to improvements in technique based on accurate knowledge in a field where, hitherto, empiricism has reigned supreme.

Radiography.

The formation[48] of The Society of Radiographers, designed to include all qualified non-medical assistants who are engaged in the practical application of X-rays under the direction of Medical Officers, is a noteworthy step. It is to be expected that one useful result of this new departure will be an all-round improvement in the conditions under which such assistants have to work and a higher percentage of first-class skiagrams.

In some X-ray departments, even in quite important institutions, there has been only a very scanty appreciation of the importance of a thorough acquaintance with photographic technique, and the advantages of well-equipped dark-rooms.

An interesting novelty in X-ray-sensitive materials due to L. A. Levy, A. L. Landau, and T. T. Baker[49] has been put on the market. It consists of a silver gelatino-bromide plate having a hardened emulsion film upon which is coated another and a readily-soluble gelatine layer carrying fluorescent calcium tungstate. After exposure, stated to range from one-fifth to one thirty-fifth of that required for ordinary X-ray plates according to the hardness of the radiation employed, the upper film is washed away in hot water and the lower film of hardened emulsion is developed. Any such method, involving the coating and subsequent removal of a fluorescent layer in intimate contact with the sensitive emulsion, necessarily has drawbacks and it is to be hoped that some water-soluble highly-fluorescent substance which can be incorporated harmlessly with the emulsion will ultimately be found, though a large amount of investigation has, so far, failed to disclose one which is both highly active and not injurious either to the sensitiveness or the stability of the silver halides.

It has been found unsafe to produce X-ray motion pictures by photographing a fluorescent screen image with the aid of a cinema camera,[50] the radiation necessary being so intense as to endanger the patient.

A valuable contribution to the technique of radiography is a paper by R. B. Wilsey,[51] on the intensity of scattered X-rays in radiography, in which he shows what a small proportion of the total radiation reaching the plate consists of useful image-forming rays when thick subjects are being radiographed or large diaphragms used.

The same investigator[52] has employed homogeneous X-rays to determine the structure of the crystal lattice in precipitated flocculent silver chloride, bromide, and iodide, and shows that these apparently amorphous precipitates are definitely crystalline in their ultimate structure and belong to the cubic system. He proposes to proceed to the examination of the crystalline grains of photographic emulsions by similar methods. The results will be awaited with great interest since such studies will probably throw light on the question of the distribution of the iodine atoms in the crystals of a silver iodobromide emulsion. There has been a strong inclination to assume, without any sort of proof, that such crystals are homogeneous solid solutions of the two halides, but

38. E. Kolshorn, E.P. 146,614, 155,575, 155,576; *J.*, 1921, 369A.
39. A. S. McDaniel and A. H. Nietz, U.S.P. 1,370,896; *J.*, 1921, 325A.
40. J. Hauff u. Co., G.P. 327,111, 328,617, and 333,687; *J.*, 1921, 371A, 603A.
41. W. Ermen, *Brit. J. Phot.*, 1921, *68*, 64; *J.*, 1921, 163A.
42. B. T. J. Glover, *Brit. J. Phot.*, 1921, 503, 519.
43. M. J. Desalme, *Rev. Franç. Phot.*, 1921, *2*, 128, 130; *J.*, 1921, 529A.
44. L. J. Bunel, *Bull. Soc. Franç. Phot.*, 1921, *8*, 290. L. Lobel, *ibid.*, *8*, 2[illegible].
45. Lüppo-Cramer, *Der Phot.*, 1921, 65; *J.*, 1921, 280A. *Kolloid-Zeits.*, 1921, *28*, 174; *J.*, 1921, 324A. *Phot. Korr.*, 1921, *58*, 121. *Phot. Ind.*, 1921, 912.
46. Lüppo-Cramer, *Die Phot.*, 1921, No. 3, 1.
47. H. M. Cartwright, *Phot. J.*, 1921, *61*, 428.
48. *J. Ront. Soc.*, 1921, *17*, 22.
49. L. A. Levy and A. L. Landau, E.P. 163,903. L. Levy, D. W. West, T. T. Baker, *J. Ront. Soc.*, 1921, *17*, 55, 104; *Phot. J.*, 1921, *61*, 158.
50. *Eastman Kodak Res. Lab. Report No.* 1130.
51. R. B. Wilsey, *Amer. J. Roent.*, 1921, *8*, 328.
52. R. B. Wilsey, *Phil. Mag.*, 1921, *42*, 262.

some observations of the writer's on the co-precipitation of these salts seem to make this supposition doubtful (see later).

Photographic Emulsions.

Experimental work on emulsion making is but rarely published. The past year is exceptional in that a few such papers have appeared giving the conclusions which have been drawn from the results, but in each case important experimental details are purposely omitted. P. Knoche[52] has unsuccessfully sought to gain some advantage by delaying the formation of the silver halide by substituting brominated organic compounds for the usual alkali bromides. C. A. Schleussner and H. Beck[54] publish the results of an attempt to elucidate the effect of varying the proportion of iodide in silver iodobromide emulsions. They find an optimum steepness of gradation and sensitiveness for a certain iodide percentage (which, however, changes with the conditions under which the emulsion is mixed) and a maximum X-ray sensitiveness in pure bromide emulsions; other points are also discussed. Their division of such emulsions into three classes is useful, but the assumption that emulsions formed by the addition of silver solutions to the mixed halides leads to the formation of a double compound of AgBr and AgI during the emulsification, and that this method therefore guarantees uniformity of composition of the precipitated grains, is in the writer's opinion not justifiable. It is easy to show that (in the presence of ammonia) the silver iodide (or a more insoluble iodide-bromide complex) is always precipitated before the bulk of the bromide, and there is apparently no reason therefore why the iodide should be uniformly distributed in any crystal or why different grains should not vary considerably in the proportions of silver bromide to iodide composing them in the early stages of ripening and very possibly even in the finished emulsion.

W. T. Wilkinson[56] has recently advocated the use of a mixture of bromide and chloride instead of the usual iodising solution in the wet collodion process, which still occupies a strong position in line and half-tone work.

There have been several important papers and discussions concerning the relation between sensitiveness and grain size of silver halide emulsions. Mees[55] has abandoned his earlier assumption of a direct connection between grain size and sensitiveness, a conclusion shown to be inevitable by the work of Svedberg (mentioned in last year's report, since published in English[57] with interesting extensions to the action of α- and β-particles) and confirmed in some emulsion-making experiments by the writer[58] and by A. P. H. Trivelli and S. E. Sheppard.[59] Svedberg's work has been recently extended by F. C. Toy,[60] who showed that even grains of identical area, shape, and thickness may vary greatly in sensitivity. J. Brooksbank[61] has shown that in the rate and degree of visible darkening of the grains in light there is a similar want of relation to size and shape. We are therefore compelled to assume differences in the molecular construction and/or the chemical composition of the crystals to be the prime factors determining the sensitivity of the individual grains, though it must still be admitted that to attain a given sensitiveness it seems from practical experience necessary that a certain minimum average size of grain should be exceeded.

Practically nothing is known at present except in a purely empirical fashion about the effects of the conditions of precipitation on the grain size of silver halide emulsions. A few experiments bearing on the subject are to be found in Trivelli and Sheppard's monograph already mentioned, but inasmuch as the results have a considerable commercial value it is unlikely that any detailed studies will be published by those engaged in the industry.

Recent papers by von Weimarn, S. Odén, and others[62] are, however, sufficient to show the extreme difficulty of such researches even in such relatively simple cases as barium sulphate precipitates. Svedberg's recently published little book on "The Formation of Colloids" contains a brief account of some of their results and a valuable bibliography. The fullest development of the art of emulsion making is likely to depend on the results of such studies, and therefore men of the highest scientific qualifications will undoubtedly be required in the industry in considerable numbers, and will need very well-equipped laboratories.

An interesting mathematical study by L. Silberstein[63] demonstrates how, as a consequence of the drying of the gelatine film, the great majority of the silver bromide grains in a dry plate lie approximately parallel to the surface.

F. F. Renwick, A.C.G.I., F.I.C.

(To be continued.)

52. P. Knoche, *Phot. Rund.*, 1921, 57, 49.
54. C. A. Schleussner and H. Beck, *Z. wiss. Phot.*, 1921, 21, 106.
55. Royal Photographic Society Meeting, Nov. 8, 1921.
56. C. E. K. Mees, *J. Franklin Inst.*, 1921, 191, 631.
57. T. Svedberg and H. Andersson, *Phot. J.*, 1921, 61, 326; *J.*, 1921, 638a.
58. F. F. Renwick, *Phot. J.*, 1921, 61, 333; *J.*, 1921, 638a.
59. Monograph, "The Silver Bromide Grain of Photographic Emulsions," by A. P. H. Trivelli and S. E. Sheppard, p. 104. S. E. Sheppard and A. P. H. Trivelli, *Phot. J.*, 1921, 61, 400.
60. F. C. Toy, *Phot. J.*, 1921, 61, 417.
61. J. Brooksbank, *Phot. J.*, 1921, 61, 421.
62. S. Odén, *Arkiv för Kemi*, 1920, 7, No. 26, 1-93. For other papers on size of particles see S. Odén, *Proc. Roy. Soc. Edin.*, 1915-16, 36, 230; *Bull. Geol. Inst., Upsala*, 16, 15, 125; and other papers. Also H. Green, *J. Franklin Inst.*, 1921, 192, 637.
63. L. Silberstein, *J. Opt. Soc. Amer.*, 1921, 5, 171, 363; *J.*, 1921, 340a, 791a.

Photo-Mechanical Notes.

Collotype Plates from Negatives by Mercury Intensification.

A recent patent specification, No. 162,640, of M. de' Spetati, 78, Corso Stupinigi, Turin, adds another to the many variations of the collotype process which have been proposed. A negative, before sensitising with bichromate and before exposure to light, is submitted to a treatment, the effect of which is that the silver incorporated in the gelatine is in part replaced by another body with larger grains, which gives place to a strong hardening of the layer of gelatine; this allows of obtaining very resistant collotype plates which can be inked very easily.

With this object use is made of treatment by bichloride of mercury and ammonia, as in intensification. By such intensification greater opacity is given to the dark portions (corresponding to the light portions of the positive), the thickness of all portions which originally contained metallic silver is increased and a larger capacity for absorbing moisture and for rejecting greasy ink is given to the light portions and to the half tones.

After the treatment with mercuric chloride and ammonia, the negative is washed over with water and is directly immersed in a sensitising bath of 2 per cent. of bichromate (preferably of ammonia), in which it is kept for about five minutes with continuous stirring of the tank.

The negative is then dried in a dry, dark place or in a place lighted with a red light, and protected from any dust.

The negative is afterwards exposed in a frame to daylight for 16 to 60 minutes, according to the intensity of the light, the negative being arranged in the frame in such a manner that the layer of sensitised gelatine containing the negative image is kept in contact with a sheet of white paper, while the back of the negative is kept in contact with the glass.

The surface intended to form the plate used for ink printing is in this manner sensitised from the back, because the light reaches more or less the surface of the bichromated sensitised layer according to the opacity of the negative image, and the chromatisation takes place in a graduated manner, thus ensuring any shade of half-tints and sparing the light portions. The negative is washed in running water or in five or six waters for freeing it entirely from the soluble bichromate, and is afterwards carefully wiped dry, for example, with a sponge. It kept in a dry place and protected from the air, it may be indefinitely preserved, and when it is desired to proceed with the ink printing, it is sufficient to immerse it for at least one hour, in a solution containing 200 ccs. of water, 300 ccs. of glycerine of good quality, and three or four drops of ammonia. This bath is kept at a temperature between 35 and 80 deg. C., according to the nature of the work.

The plate is wiped over dry and mounted on a suitable support, and may then be utilised in any printing machinery provided with good inking.

The zones of the surface of the plate upon which the light has acted, become more or less unpolished, according as they have been subjected more or less to the action of the light, and they retain more or less the ink according as they are more or less unpolished; the zones which have not been subjected to the action of the light are, on the contrary, more or less polished and more or less saturated with moisture, and they reject greasy ink owing to the absorbed moisture.

The images obtained by the printing of plates prepared according to the present process are stated to be of a fineness equal to that given by photography owing to the absence of any visible grain.

Celluloid Collotype Printing Plates.

The use of a celluloid support for the layer of bichromated gelatine in the collotype process is the subject of a patent, No. 170,545, granted to M. de Sperati, 78, Corso Stupinigi, Turin. The celluloid is given a substratum consisting of a mixture of gelatine with a solvent of the celluloid for the purpose of obtaining a complete adherence of the subsequent layer of gelatine to the celluloid sheet.

The process is carried out by spreading the mixture of gelatine and celluloid solvent upon the surface of the celluloid by means of an emulsifying machine of any known type.

After this a 10 per cent. emulsion of gelatine of medium hardness is prepared and to this emulsion a suitable antiseptic is added, such as carbolic acid. The emulsion is spread hot by means of an emulsioning machine at a temperature of about 50 deg. C., and at the rate of about 5 ccs. per square decimetre upon the celluloid which has been treated in the manner which has been indicated and afterwards dried in a ventilated place at a temperature of about 30 to 35 deg. C.

The celluloid thus treated is cut to the desired size and kept protected from dust and moisture; it keeps indefinitely, and may be sold in this form in which it may be used for printing after being simply subjected to a sensitising bichromate bath.

In order to prepare the collotype plate, the sheets of celluloid are sensitised by immersing them in a solution of potassium bichromate at 3 to 4 per cent. Good results are obtained by adopting the following composition:—

Distilled water	100	ccs.
Potass bichromate	3	gms.
Ammonia 22 Bé	3	ccs.

After treatment in this bath, which should last from three to five minutes, the sensitised films are dried in darkness at a temperature of about 30 deg. C. The exposure of the bichromated layer to the light is effected underneath an ordinary photographic negative. The exposure may be effected as usual by placing the bichromated gelatine against the gelatine of the negative after having laterally reversed the negative image, and in this case very defined or sharp images are obtained; or the exposure may be effected through the back, this being permitted by the support of celluloid being even, translucent and thin, and in this case the lateral inversion of the negative image is done away with.

By operating in the second manner, very good collotype reproductions are obtained having peculiar soft shades.

After exposure a thorough washing with water eliminates the soluble bichromate, the plates are treated in a bath of water and glycerine, and the inking and printing are effected in the ordinary manner.

The following patent has been applied for:—

PRINTING PROCESSES.—No. 13,456. Photo-mechanical printing processes. A. R. Trist

---

FORTHCOMING EXHIBITIONS.

June 1 to 30.—Royal Photographic Society. Prints by Pirie Macdonald, of New York. Open daily from 11 to 5 p.m., 35, Russell Square, London, W.C.1.

August 26 to September 9.—Toronto Camera Club. Latest date for entries, July 22. Secretary, J. H. Mackay, Toronto Camera Club, 2, Gould Street, Toronto, Canada.

September 9 to October 7.—London Salon of Photography. Latest date for entries, August 30. Particulars from the Hon. Secretary, London Salon of Photography, 5a, Pall Mall East, London, S.W.1.

September 11 to 15.—Professional Photographers' Association, Princes Galleries, Piccadilly, London, W. (Trade and Professional). Hon. Secretary, Richard N. Speaight, 157, New Bond Street, London, W.1. Also foreign invitation loan exhibition of professional portraiture. Hon. Secretary, Marcus Adams, 43 Dover Street, London, W.1. Latest day for entries and exhibits, August 31.

September 18 to October 28.—Royal Photographic Society Annual Exhibition. Latest date for Entries, August 25 (carrier); August 26 (hand). Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, May 29 to June 2:—

PLATES.—No 14,997. Manufacture of photographic plates and films. H. E. Coley.

FOCUSSING DEVICE.—No. 15,144. Focus controller for photographic copying cameras and enlargers. C. Lane.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

VERTICAL SELF-FOCUSSING ENLARGERS.—No. 156,224 (March 28, 1916). The apparatus comprises a pivoted arm or bracket forming a support for the camera and so arranged that as the camera is moved towards or away from an easel or projection screen its axis is kept normal to the plane of the screen, operative mechanism being provided between the arm and the camera or lens whereby any movement of the support relatively to the easel automatically effects the focussing. Preferably a parallel linkage is employed to support the camera, the camera itself being mounted upon an adjustable member on the support and provided with a rack engaging mechanism connected to one of the pivoted links adapted

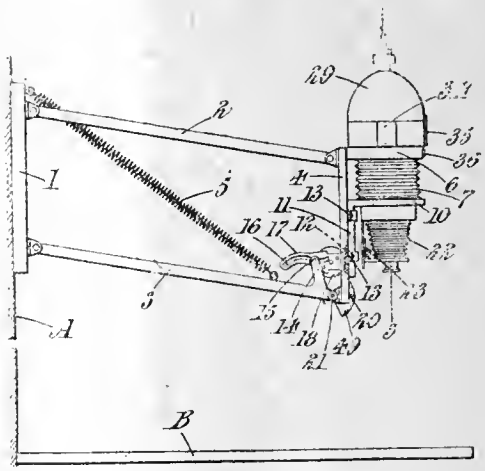


Fig. 1.

to co-operate with the rack so as to maintain the required focus when the support is moved about the arm, clamping mechanism being also conveniently provided to prevent relative movement between the arm and support when the required focus is being secured. The pivoted arms are preferably counterweighted or spring controlled to balance the weight of the camera and its support and a source of light, for instance an electric incandescent lamp, is secured to the rear end of the camera or to a bellows extension thereof adapted to participate in the movement of the camera support, spaced translucent plates being preferably interposed between the source of light and the negative whereby the light is properly diffused and ventilation to prevent overheating is secured.

In the construction illustrated in figs. 1 to 5, A represents the side wall of a room or any other rigid vertical support, and B the top of a table or other horizontal support for the printing paper constituting the easel or projection screen. Secured to the

wall is a block 1 to which are pivoted swinging arms 2 and 3 having their outer ends connected to a camera support 4 counterbalanced by a spring 5 so that the whole structure constitutes a parallel linkage which can easily be moved up and down into any desired position, the support 4 always being kept normal to the plane of the table B.

The block 1 is mounted upon the wall at a suitable distance above the table B, depending upon the focal length of the camera employed. Rigidly secured to the support 4 is a frame 6 carrying a bellows 7 having at its opposite end a frame 9 (fig. 3) secured to a sliding carrier comprising arms 10 and a bar 11 carrying a rack 12. The bar 11 is mounted to slide in guides 13 on the support 4.

On the lower arm 3 of the parallel linkage is an upwardly projecting lever 14 having rigidly secured thereto a pin 15 engaging a cam slot 16 on an arm 17 secured to a toothed quadrant or pinion 18 meshing with the rack 12. The pinion 18 is mounted to rotate in a bracket 19 carried by the support 4 and a clamping

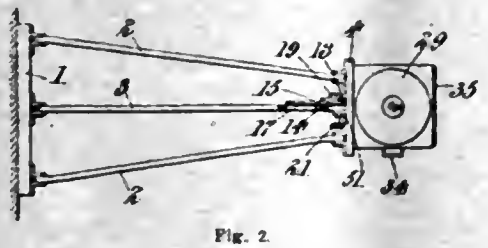


Fig. 2.

screw 21 is provided by means of which the arm 3 and support 4 are held against relative movement when the desired point of adjustment is reached. The camera 22, which may be of any known type, is shown as being provided with the ordinary focussing arrangement 23 and is secured to the frame 9 by means of clamps such as 24 (fig. 3), which may be of any suitable construction. The frame 6 is provided with guides 25 adapted to receive a plate holder 26 flanged to receive the negative 27.

Secured to the frame 6 is a hood 29 provided at its upper end with an electric incandescent lamp 30, and between this source of light and the negative are preferably mounted a series of ground-glass plates 31 supported in suitable guides or carriers 32. As shown, these carriers are spaced so that a current of cool air from outside may pass between them, this air entering through a

Fig. 4.

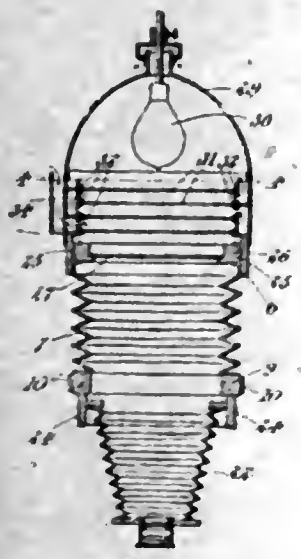


Fig. 3.

Fig. 5.

passage 34 and escaping through an opening in the top of the hood as indicated by the arrows. The slides are introduced through doors 35, 36 (fig. 1).

Forming an extension of the free end of the arm 3 is a scale 40 over which moves a pointer 20 connected to the support 4, this scale being graduated to indicate the degree of enlargement which is being obtained.

The operation of the apparatus is as follows: A negative of the picture to be enlarged is inserted into the apparatus and the light turned on. The focussing screw 23 of the camera is then adjusted to bring the image into focus on the surface B. The camera support 4 is then moved up and down so that the image is projected on to the surface B, this movement changing the relative position of the arm 3 and support 4 and as the pin 15 moves in the slot 16 the pinion 18 is rotated, adjusting the rack 12 to a corresponding extent and thus moving the camera supporting frame 10. The slot 16 is so designed that the distance through which the camera lens is moved will be that required to keep the projected image always in focus, in the particular instance illustrated the curvature of the cam being adapted for a lens having a focal length of five inches.

The operator can thus readily determine with the projected image before him on the surface B just what degree of enlargement is desired or what portions of the enlarged image he may wish to print because the image always remains in focus whatever the degree of enlargement.

Not only does the spring 5 enable the device as a whole to be readily moved, but the pivoted links enable the whole apparatus to be swung against the wall or other support A so that the apparatus is easily disposed of when not in use.

If the supporting device is to be used without an automatic adjustment a pinion 18¹, such as that illustrated in fig. 7, operated

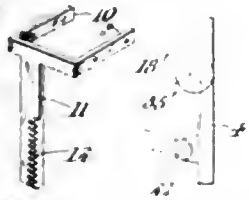


Fig. 6.

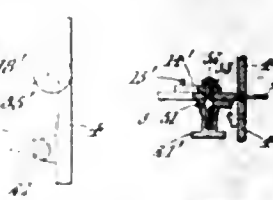


Fig. 7.

Fig. 8.

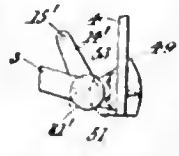


Fig. 9.

by means of a hand wheel 35¹ may be employed, such an arrangement being useful where the camera has no focussing arrangement of its own.

Further, as shown in figs. 8 and 9 the pin-carrying lever actuating the focussing rack may be made adjustable. In that case instead of the arm 14 being rigidly secured to the link 3 an adjustable arm 14¹ having a pin 15¹ is connected to the arm 3 by means of a screw-threaded bolt 52. This bolt is carried in a bracket 51 so as to rotate freely therein, the ends of the bolt being respectively provided with a clamping screw 21¹ and a locking screw 53 to lock the lever 14¹ in the position of adjustment relatively to the arm 3. When the arm is formed adjustable for lenses of different focal lengths, interchangeable slotted arms 17 will be provided having differently curved cam slots necessitating a different setting of the pin 15.—Kodak, Ltd., Kodak House, Kingsway, London, W.C.2, assignees of Roy Samuel Hopkins, 1221½, Market Street, Parkersburg, W. Va., United States.

Dismissing Commercial Travellers.—At the recent Photographic Fair the question of commercial travellers' notices was hotly debated by some parties concerned. Although (writes a correspondent) the particular case referred to has not been the subject of a legal action a similar case was fought a few days ago in the City of London Court. A commercial traveller sued a City firm of manufacturers for £90 damages for wrongful dismissal. Plaintiff was a commercial traveller at £7 a week and commission, and after working for three months he was dismissed with a week's notice. He claimed that there was a universal custom that commercial travellers were entitled to three months' notice, and made his claim accordingly. The defendants said the plaintiff was engaged for three months on trial, but that in any event he was only entitled to a week's notice, which was given him, and that travellers were not entitled to three months' notice. The judge held that the plaintiff was not engaged on trial, and that commercial travellers in the City, he cared not what trade they belonged to, could not be dismissed on a week's notice, simply because they were paid their salary weekly. In his view, if there was not a universal custom, he held that a reasonable notice for a commercial traveller was three months, and therefore he gave judgment for the plaintiff for £84 and costs, stating that he would facilitate an appeal if the defendants so desired, in order that the matter might be settled once and for all.

New Apparatus.

Heatrae Electric Developer Heaters. Made by Electric Fires, Ltd., King Street, Norwich.

Some months ago we published a short note describing an electrical heater of tubular form which had been introduced by a French manufacturer for the warming of photographic developing and other solutions, and for the rapid dissolution of chemicals in water. The reference brought us a letter from Messrs. Electric Fires, Ltd., informing us that they were manufacturing appliances of this kind, and would send us some of the first models for our trials. Since then we have had the opportunity of testing two of the three forms in which these electrical heating appliances are made. The first is that shown in Fig. 1, and is a heater for warming considerable bulks of solution, such as those used in the quantity development, etc., of films, or in the development of cinematograph film. The heater consists of a metal tube 45 ins. in length, and shaped like a walking stick. The heater portion consists of a flat blade (enclosing the resistance) forming about 9 ins. of the lower part of the appliance. The heater is simply connected to the lamp-holder of any electric circuit capable of bearing a load of 6 ampères, and is then simply

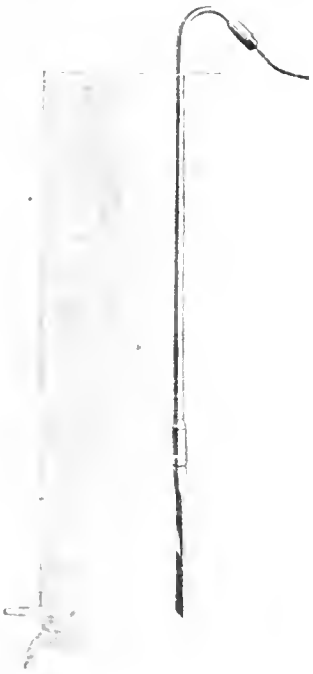


Fig. 1.

Fig. 2.

Fig. 3.

used as a stirrer in the solution which is to be warmed. Using about three-quarters of a gallon of water at an initial temperature of 68 deg. F., we found that approximately the temperature was raised 10 degs. during each 3 minutes' action of the heater, that is to say, in 12 minutes the temperature had been raised from 68 deg. to 108 deg.

Heating at this rate continues approximately uniform until the water is brought to practically boiling heat. It will thus be seen that the heater provides a most convenient and expeditious means of bringing working solutions to a convenient degree of warmth during the cold weather and likewise of providing hot water for dissolving chemicals when making up stock solutions. For this latter purpose the chemicals need simply to be put into the cold water, the heater immersed and the whole stirred occasionally until solution takes place. The convenience of warming water in this way without the necessity of placing the containing vessel on an intense source of heat, such as a gas ring or coal fire, is one which scarcely needs to be recommended to those employing photographic solutions on a considerable scale. The price of this heater, complete with 6 ft. of flexible cord, is £2 10s.

A smaller pattern of tubular heater is made, as illustrated in Figs. 2 and 3. Like the former its consumption is 600 watts or 6-10th of a unit, per hour, but it is of smaller dimensions, namely, 11½ ins., for use in shallower tanks or in large dishes, or, as illustrated in Fig. 2 for dissolving chemicals upon a smaller scale. The price of this heater is £1 19s.

In addition to the above Messrs. Electric Fires, Ltd., have designed an electric hot-plate specially for the use of photographers using either dishes or developing tanks. The plate is 11 x 8 ins. in area and stands 2½ ins. high. Its current consumption is, again, 600 watts. Naturally the heating efficiency of an appliance of this kind is not equal to one in which the heating element is immersed in the liquid, but perhaps for such moderate increments of temperature as are required for photographic solutions, this is an advantage rather than otherwise. Some idea of the rate at which a bulk of solution is warmed by the hot plate will be gathered by saying that three-quarters of a gallon of water contained in a tank of enamelled metal, was raised in temperature from 67 to 120 deg. in half an hour, that is to say approximately at the rate of 2 deg. per minute. A smaller bulk of solution, particularly if contained in a flat dish, presenting a larger area of contact with the hot plate, is raised in temperature at a more rapid rate. The price of the Heatrae hot plate, inclusive of 6 ft. of flexible cord, is £1 2s. 6d.

After having had ample opportunity of noting the use of these

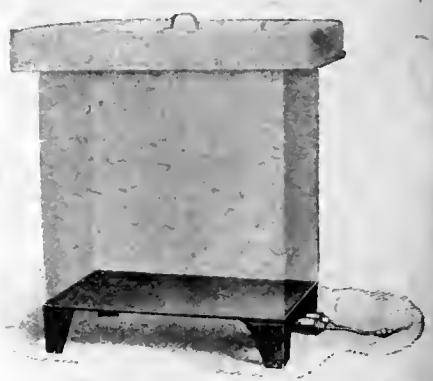


Fig. 4.

appliances, we can thoroughly recommend them. The professional worker will welcome them as still another step towards a ready standardisation of working conditions, whilst amateurs who can use electric current will find them veritable luxuries in the dark-room.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Sunday, June 18.

Hammersmith Hampshire House Phot. Soc. Outing to Woking.

Monday, June 19.

Southampton Camera Club. "Retouching." Miss Nellie Smith.

Tuesday, June 20.

Royal Photographic Society. "The Norwich School of Painters." Edward Peake.

Bournemouth Camera Club. Outing to Alum Chine.

Hackney Phot. Soc. Print and Slide Competition: "A Picture containing a Sky Effect."

Manchester Amateur P.S. Bromoil Prints, by A. C. Banfield.

WEDNESDAY, JUNE 21.

Bournemouth Cam. Club. Visit Richmond Hill Printing Works.
Bradford Phot. Soc. Outing to Hirst Woods.
Dennistoun Amateur Phot. Assoc. Outing to City Streets.
Exeter C.C. Cliff Walk—Exmouth and Budleigh Salterton.
Hackney Phot. Soc. Outing to Wimbledon Common.
Partick Camera Club. Print Criticism.
Rochdale Ama. P.S. Jumble Sale of Photographic Apparatus.
Southampton Camera Club. Outing to Meon Valley.

THURSDAY, JUNE 22.

Hammersmith Hampshire House Phot. Soc. "Bromide Enlarging." J. Ainger Hall.

SATURDAY, JUNE 24.

Bradford Phot. Soc. Yorkshire Photographic Union Annual Excursion to Hebden Bridge.
City of London and Cripplegate P.S. Outing to Perivale.
Dennistoun Amateur P.A. Outing to Hunter's Quay—Yachting.
Hackney Phot. Soc. Outing—Hayes to Keston.
Hammersmith Hampshire House P.S. Outing to Chessington.
Rochdale Amateur Phot. Soc. Outing to Chew Valley.
Sheffield P.S. Outing to Hebden Bridge (or Lichfield).
South Suburban Phot. Soc. Outing—Bankside (Thames).

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, June 13, Mr. Dudley Johnston in the chair.

A purely technical evening was spent, under the control of the Pictorial Group.

Mr. F. T. Usher delivered a lecture on the "Matt Surface" plates of Messrs. Elliott and Sons Ltd., of Barnet. These plates, placed upon the market a month or two ago, contain, he explained, a very finely divided substance in the body of the emulsion. Their manufacture had been undertaken as the result of the correspondence on halation in the "British Journal of Photography" last year. Mr. Usher, as a technical photographer of many years' standing, had long taken a special interest in the non-halative properties of dry-plates, and had come to the conclusion that a chief factor in the elimination of halation was the character of the emulsion surface. By way of evidence in support of this view, he showed a number of lantern slides from negatives taken on unbacked plates of subjects which presented every opportunity for the production of halation. The latter, however, was conspicuous by its absence. Some of these negatives had been taken on the Barnet "Studio Ortho" plate. Mr. Usher considered that, in addition to the physical characteristics of the emulsion film, its colour-sensitive properties, and particularly the presence of a screening dye, greatly reduced the tendency to halation. In the "Matt-Surface" plates great scatter of light was produced by the material incorporated with the emulsion. The lecturer showed a large number of slides, from negatives by himself and others, which formed an exceedingly fine testimonial of the plates as regards freedom from halation under the most trying conditions. Some of these were of a high-power half-watt lamp, the lettering on the bulb and the form of the filament being sharply rendered. All were taken without any backing on the plates.

As regards the enlargement of the negative, he pointed out that it was inadvisable to use a condenser lantern with a point source of light, on account of the magnification of the grain of the scattering material, but if a sheet of ground glass was used behind the negative for diffusing light, the enlargements showed no evidence of the particular character of the emulsion film. The matt surface of the negatives allowed of retouching being done with extraordinary ease. The surface received ordinary lead pencil as readily as a sheet of paper.

In the somewhat lengthy discussion which followed, Mr. A. C. Banfield said that he has used a large number of the plates for studio portraiture, and considered them ideal for this work. He found it impossible to get halation on them, even under such critical conditions as the use of a powerful spot-light immediately behind the sitter.

In reply to a question, Mr. Usher said that the plates were made in two speeds, the faster being issued as 550 H. & D. He regularly used amidol without bromide as the developer. Generally, with any plate, it was his custom, if the subject threatened halation, to develop detail first, to remove the plate from the developer at an early stage, and, after fixing, to obtain the required gradation by intensification.

Mr. K. C. D. Hickman then appeared to take advantage of the last evening of the session available for the purpose, to show a most ingenious pneumatic device of his invention, serving for keeping chemicals in constant movement when making up a solution, likewise for keeping prints in movement in the fixing bath, and also for giving a rocking movement to dishes, etc. He had named the appliance an "agitator and solutioner." It consisted of an arrangement of communicating glass tubes and bulbs, which could be fixed anywhere on the workroom wall. When supplied with a moderate continuous stream of water, it caused an intermittent rise and fall of water in an open-ended glass bulb which could be immersed in a bottle or developing dish. The bulb was connected to the apparatus by a length of rubber tube. Mr. Hickman demonstrated the device, and showed the speed with which the necessary quantities of sulphite, carbonate, etc., for a developer stock solution dissolved in cold water by the use of the apparatus without any attention. Moreover, the chemicals were dissolved without agitating the liquid in contact with air. The bulb, in like manner, could be placed in a fixing bath containing prints, and then served to keep the solution in movement.

Votes of thanks to the lecturers brought the proceedings to a close.

CROYDON CAMERA CLUB.

It happened that a little while ago Mr. Handel Lucas gave a lecture on colour. Few know better how to mix and apply pigments to canvas, and few would have had the pluck to advance, as he did, theories hardly in accordance with modern conceptions relating to the science of colour.

Of course, it is no more necessary that a painter should grasp these conceptions than a photographer should know, say, the theory of the objective plane. But an enterprising secretary thought otherwise, and immediately booked three scientific toughs to exterminate the honest opinions of the artist, and incidentally to afford instruction to others on a subject none too easily understood in all its bearings.

The trio were neatly announced on the notice-board by Mr. Sellors as follows:—"The Three (Colour) Blind Mice, Messrs. J. W. Parkis, L. J. Hibbert, and E. G. Budd, will run up the Artist's Clock." Three to one! On the face of it an unfair contest.

On points, it must be admitted, Mr. Lucas was laid out for decent burial time after time, but points and actual fighting are two very different things, and when it came to fighting, never was he seriously shaken. Hard pressed in the "additive" corner, he nimbly dodged to the "subtractive" side, and by the time the bewildered three had followed him there, back once again he was in the original position. Details of the rounds must, perforce, be omitted, but in fairness it should be said that not once had the combatants to be separated for mental contact.

The "elusive Pimpernel" was ably seconded by Mr. Harpur, who jabbed in at intervals, and further distracted the luckless trio. His classification of a yellow shown (formed by overlap of red and green rays) as "tobacco juice suffering from an attack of jaundice," did not meet with the approval of the lecturers.

Apart from their failure to demolish Mr. Lucas, in all other respects they did right well, and with Mr. Hibbert as the main speaker, explained in the most lucid fashion the science of colour as applied to the mixing of coloured light, and pigments, and the cardinal points of difference between the two. Many pretty experiments were included in the intervals between the rounds.

When all parties had retired from the ring (Mr. Lucas as fresh as paint, the others in not quite pristine condition), the former summed up his position. He vastly preferred common sense to science—(cheers)—and pointed out that since teaching had been contaminated with scientific heretical dicta on colour, art had been going down, and down, and down. This drew an energetic protest from Mr. Budd, who thought it hitting below the belt to fasten the freaks of futurists, and others of that ilk, on the unfortunate scientist.

POSTAL EXPEDITION!—We see in the daily Press that the Crown Hotel, Broxbourne, Hertfordshire, received a few days ago a postcard despatched twenty-three years ago by the Hackney Photographic Society, ordering accommodation for a party. The secretary of the Hackney Society is now sending out his correspondence relating to excursions for the year 1945.

News and Notes.

£3,000 Competition.—In addition to Mr. George Robey, Mr. W. L. F. Wastell, and the others mentioned last week, Miss Phyllis Neilson Terry will be one of the judges in this competition for photographs from negatives on plates.

Apem Notes and News for June contains particulars of a new Apem box form roll-film camera, a new Rajar extra-vigorous bromide paper for D. and P. work, and of an inexpensive dry-mounting press of new pattern for the amateur. "Notes and News" is obtainable, free, only by dealers in photographic requisites, on application to A. P. M., Ltd., 3, Soho Square, London, W.1.

Glasgow Housing Exhibition.—In connection with the Housing and Health Exhibition promoted by the Glasgow Corporation, and to be held in September and October next, a photographic competition will again be organised, and will include sections for all classes of workers, pictorial, technical and juvenile. Prizes will be awarded. Particulars and entry forms from Mr. C. P. Hainsworth, Kelvin Hall, Glasgow.

Picture Postcard Enterprise.—Some very artistic photographs of the new L.C.C. Hall at Westminster—the productions of the well-known Dundee firm of Valentine & Sons—were on sale in London within six days of the removal of the scaffolding, certainly a feat considering the long distance of Dundee. The point of view selected—and an unusually good one—includes Westminster Bridge, with the statue of Boadicea in the foreground.

Feet in Photographs of Groups.—A society paragraphist in the "Star" writes that the society bride who intends to have her bridal group in all the illustrated papers really ought to take steps to instruct her attendants in the art of sitting or standing. Nine out of ten bridesmaids endeavour to twist their legs round the legs of the chair they occupy or else cross their legs and show an unnecessarily hoydenish expanse of silk stocking. Even the bride herself is not always guiltless. Operators who are called upon to take such groups may profit by the hint.

Ross Window Bills and Showcards.—Messrs. Ross, Ltd., 3, North Side, Clapham Common, London, S.W.4, send us a large parcel of the many window bills and showcards which they have prepared for the use of dealers. The number and variety of these showcards and their extremely handsome appearance will be sufficient to remove from a dealer's mind any feeling he may have entertained that British lens makers were not doing as much as they could towards promoting demand for their instruments on the part of the public. The showcards consist of actual photographs, ranging in size from 7 x 5 to 12 x 10 inches of attractive subjects, among which are portraits, nature studies, sports, architecture, and the inevitable bathing girls. The prints are most artistically mounted on heavy art boards provided with suitable borders and with hinged struts for convenience in window dressing. There are also one or two showcards consisting of striking artists' drawings in colour of popular sporting events. Among the selection are also some smaller window bills measuring 8 x 6 and 6 x 5 inches, and emphasising the merits of Ross lenses. In addition to this advertising matter, which makes its appeal to the eye, Messrs. Ross supply for distribution to customers over the counter an attractive 24-page booklet, "The Choice of a Lens," containing many reproductions of the work of Ross lenses and instructive letterpress on the selection of an objective for a photographer's special purposes. Dealers throughout the world who are selling the Ross optical manufactures should see that they have a supply of this most effective sales-making literature.

Portraits in Water-colours.—When we chronicled, a month or two ago, the re-arrangement of the former firm of Jeffery and McLeod, we omitted to refer to the fact that the artist partner in this firm, namely, Mr. Angus McLeod, was continuing individually to follow his profession at 3a, Sandringham Parade, Ealing, London, W.5. Mr. McLeod has so long and so deservedly enjoyed a high reputation among the artists contibuting to the success of portrait photographers, that it is due to him to refer to his established status in this capacity, and an opportunity of seeing a collection of examples of his recent work is one which we were very glad to have. Twenty five years' practice in the making of water-colour portraits from photographers' originals have served only to enhance the artistry of Mr. McLeod's work and to emphasise his versatility. An artist whose work supplements that of the studio photographer has necessarily to confine his style, more or less, within limits which are imposed upon him by the nature of the originals with which he is called upon to deal. Nevertheless, the thorough training, such as Mr. McLeod had in the Scottish and English art schools, shows itself in the qualities which an artist such as he can give to enlargements or prints in water-colours and oils. Examples which we examined with a great deal of pleasure included some most attractive styles, among them one, the Leslie, in which an oval portrait in water-colours is presented on a single piece of paper, with plate sunk surround of the oval. In another, the Shannon, an attractive tapestry effect is worked into the background, again of an oval portrait. A peculiarly rich yet delicate style of portrait, recalling the French mezoztints, is the Willis, in which a tint of deepened cream is given to the background, whilst the portrait space is provided with the ruled and toned borders after the admirable manner of the French water colourists. Still another, the Richmond, which well emphasised the variety of technique at the command of Mr. McLeod, was a water-colour portrait having the full saturated richness of an oil painting. But Mr. McLeod's work is not only in water-colour; it includes enlargements in monochrome finish, and also enlarged portraits with the minimum of artist's work upon them. Moreover, a branch of work in which he has long specialised is the reproduction of faded photographs, old engravings, and other originals, fresh and better reproductions of which are often wanted. When we have added miniatures in water-colour on ivory to the list of his various branches of artistic work for portrait photographers, we have, perhaps, said enough by way of emphasis of the work of one whose craftsmanship has earned widespread recognition among leading makers of photographic portraits.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

CINEMATOGRAPH PORTRAITURE.

To the Editors.

Gentlemen,—It was very gratifying to us to see your leaderette upon the excellent work done by Miss Olive Edis in connection with the above.

You will recognise that during the course of last year we consistently advertised in your "Journal" and issued other propaganda on the lines of advising professional photographers to adopt this line as an adjunct to their regular professional photographic business.

It has been a matter of disappointment and concern that the response we have had has been so unimportant. The success of Miss Edis, apparently with our apparatus, should be a great incentive to other professionals. When we have discussed this matter from time to time we have always been told that the outlay is prohibitive for such an installation, but as we have so often said, this is a mistaken idea. The outlay to do work such as Miss Edis does is as follows:—

A camera, a spare film box and a tripod, an outlay *under* £40, which is subject to a discount.

There is no necessity for further outlay for developing and printing outfits unless the business grows to considerable dimensions, for there are first-class houses who undertake this work and carry it out well and expeditiously at reasonable prices.

Besides this, there is a further development for sales by the professional: they should have, if possible, in their studios a small home cinematograph for demonstrating the films taken, which can be purchased at a price of about 16 guineas. By demonstrating on this machine it is obvious that it must make sales of such machines for the professional, for the class who will commission the photographer to take film subjects such as Miss Edis takes are the class who will be ready to outlay a further small sum for the purpose of displaying the films themselves in their own homes,

and further than this, those who have machines in their own home constantly want additional subjects, and for general amusement purposes there are available films of general interest for display in the home.—Yours faithfully,

pp. W. Butcher & Sons, Ltd.,
Isidor Joseph,
Director.

Camera House, Farringdon Avenue, London, E.C.
June 12.

DEVELOPMENT OF WARM BLACK BROMIDES.

To the Editors.

Gentlemen,—With reference to your note on p. 334 on warm black bromides, you recommend the use of chromium bleacher, followed by amidol to improve the colour. This works well with most brands of paper on the market, but there are one or two in which this treatment usually gives yellowish-whites, even if all the usual precautions are strictly observed. I have not discovered the reason, but if trouble is experienced in this direction it is recommended that the bleaching bath be made up with potass ammonium chromate or ammonium bichromate in place of potass bichromate, and that the bath once used should be thrown away. Even this procedure is not certain with some grades, semi-matt and glossy particularly, of some brands, and operations conducted by artificial light with a borax M.Q. developer seems to give less tendency to stain. Not being a chemist I have not been able to carry the experiments I have made to a definite conclusion, but if the print with all precautions shows degraded whites, the permanganate, acetic acid, and salt bleacher published by you recently will often clear the print—if it is worth the trouble.—Yours faithfully,

A. H. Hall.

Eliot Vale, Blackheath.
June 10.

DO ACID FIXING BATHS CAUSE BLISTERS?

To the Editors.

Gentlemen,—With reference to the above inquiry, made by a correspondent in your issue of 2nd inst., I, too, am a constant user of the alum-acetic fixing and hardening bath, recipe for which is given on p. 454 of the current "Almanac," but only for certain plates and those it is specially recommended for—the "Barnet," for example.

Used in a normal condition—as advised in the "Almanac"—the bath will suit any make of plate, but any increase of the hardening part, and more particularly the acetic acid, means blistering with some makes of plates, especially some of the ultra-rapid ones.

The rather primitive experiments I made some time ago led me to come to the conclusion that the acetic acid in the fixing and hardening bath had a solvent action, not only on the gelatine film, but upon the substratum, an action the hardening effect of the alum was not sufficient to counteract.

The obvious remedy is to follow the instructions given in the "Almanac" and by makers, however hot the weather may be, and not to imagine that you can improve upon the methods introduced and advocated by experts, and who arrive at conclusions only after much experimenting in a really scientific manner.—Yours truly,

C. H. O.

ENLARGING WITHOUT CONDENSERS.

To the Editors.

Gentlemen,—Your article in current issue of the "Journal" on enlarging without condensers is very misleading and incorrect. You state in paragraph 2, "Arc lamps are too clumsy and troublesome to be used in an average dark-room."

Having over twenty-five years' experience of enlarging by every known method, I beg to state most emphatically that the best, most perfect, and up-to-date enlarging apparatus manufactured to-day is Boardman's automatic condenserless enlarger fitted with four arc lamps, which are of very light construction, powerful, fool-proof, safe and efficient. The carbons are renewed in half a minute, burn steadily and continuously for hours without attention, noise, or flicker. The light is perfectly diffused without any additional ground glasses or other auxiliary nuisances, and, unlike mercury-vapour or condenser types, it is very comfortable to work with, never reproduces hand work from the negatives, and does not crack or blister negatives when left in the lantern for a considerable time. It is a great time-saver, the light is fixed and constant, and does not require centering as in a condenser type; also there are no condensers to steam off in cold weather. The current consumption is less than 10 amps; average exposure six seconds. An efficient and economical enlarger has yet to be devised to equal it.

I hold no brief for the makers, Marion and Co., but can recommend a piece of apparatus when I use it daily and find it indispensable and far away the best.—Yours truly,

George Turner.

13, Eccleston Street, London, S.W.1,
June 13.

[We agree with our correspondent that it was an oversight on our part not to have excepted the Boardman condenserless arc enlarger from the remark made in the passage which he quotes. Employed as a battery of four, the arc lamp is admirable as the light-source for illumination by reflection. We should have been more explicit in confining our reference to the older patterns of arc, occupying much more space and requiring more frequent adjustment.—Eds., "B.J."]

BLUE SCREENS IN COPYING STAINED PRINTS.

To the Editors.

Gentlemen,—As a tone and colour process operator who is frequently handling prints of the character described by your correspondent, Mr. C. Venning, in the "B.J.," of June 2, may I be permitted to express considerable doubt as to the results obtained with blue filters.

The first instance is not at all surprising as regards the ink stain (presumably bluish), which would naturally be suppressed. It is the "somewhat expected result," which is surprising, inasmuch as it is contrary to both theory and practice.

That a filter transmitting, say, roughly, only wave lengths between, λ 4,000 and λ 5,200 should improve the reproduction of a yellowed print will need a big stretch of imagination on the part of most practical operators before acceptance.

If Mr. Venning's second instance is correct, our present colour processes are inside out. I pity the fine etcher who has to etch a blue plate with the yellows, etc., "eliminated by a blue filter," or the retoucher sitting down to the negative of a yellow freckled client taken under similar conditions.

However, it was some years ago, and Mr. Venning was only in the experimental stage, so that he may have confused the entries in his record. It is also possible in the first instance, that the conditions of exposure and development were so altered as to produce a much more contrasty negative, thus neutralising the effect of the filter, which ordinarily would darken the yellowish high-lights.—Yours faithfully,

J. F. Milner.

364, Humberstone Road, Leicester.
June 8

SYSTEM IN HALF-TONE OPERATING.

To the Editors.

Gentlemen,—The controversy raised by Mr. Bierman in your columns, regarding half tone operating, is a timely reminder of the fact that present-day half-tone practice is losing touch with the demonstrated principles upon which it is based. The confusion of thought created by opponents and exponents alike is, in fact, so extensive that it is difficult to employ even such familiar terms as "pinhole," "diffraction," or "normal distance," without raising a whole crop of misunderstandings.

Mr. Bierman will pardon me for suggesting that he appears to have completely misread the article in the "Process Year Book," 1898, by my father, the late Mr. U. Ray, and consequently misunderstood its teachings, and conclusions to a very material extent. I may point out that the diagram on page 37 of the "Year Book," which he describes as showing "that the enlargement of a stop would actually decrease the nucleus of the dot," refers only to distances below the "normal," and that it definitely excludes, as a footnote is careful to explain, all cases "where diffraction is a prominent factor." Mr. Bierman finds himself unable to reconcile the "pinhole theory," with the practice of employing two or more different stops in making a single exposure. This is due to a very common miscalculation which overlooks the fact that sectional diagrams of the nucleated pinhole image do not fully represent the actual conditions obtainable in half-tone practice, except in the solitary case of the square stop placed, diamond fashion, with its sides parallel to the screen lines. With the usual round or square stops, the position

for perfect gradation is diffused within fairly wide limits. This is fully explained on page 36 of the article in question. The lower of these limits, I may add, is that much maligned entity known as the normal distance.

While fully recognising the influence of diffraction as an important factor, I am afraid that I am unable to follow Mr. Bierman when he speaks of measuring the amount of diffraction, or of diffraction being in proportion to this or that optical factor. But if, as I presume, he has measured the growth of the half-tone dot under various definite conditions, the information ought to be of great service to process workers. After all, what we really require for systematic practice is some quantitative study of the phenomenon, as a whole, which should give us definite data regarding the effect of varying conditions of stop and screen distance on the rendering of gradations by the half-tone screen.

In Mr. Bierman's experience, the equation, on which Messrs. Smith and Turner's system is based, does not hold good for the wide range of screen rulings from 50 to 200. That may be so, but it only proves that some correction is necessary, and by all means let us welcome that correction formula when it is forthcoming. So long as the necessity for such correction is definitely established, it is immaterial whether we ascribe it to diffraction or irradiation, or some ocult influence. But, in any case, the equation itself, or some similar expression in terms of screen ruling, camera extension, diaphragm aperture and screen distance, must of necessity continue to be the basis, not only of this, but of any other system that may be desired.

In this connection, Mr. Bierman raises a very pertinent question when he speaks of obtaining "identical negatives," or "a similar effect," with widely different screen rulings. Considering that the range of contrasts in a half-tone reproduction is demonstrably different with different screen rulings, is it really necessary that 50-line and 200-line negatives should have "the same gradation"? If not, what is the criterion or basis of comparison, that would enable us to say definitely what corrections, if any, are necessary for different screen rulings? The question is evidently one of much greater complexity than appears on the surface.

The one thing lacking in all process "systems" that I have come across is some simple method of measuring the total range of gradations in the original; for it is this factor which determines the degree of departure from "normal" conditions that may be necessary for the proper reproduction of a particular copy.—Yours faithfully,

SUKUMAR RAY.

100, Gurpar Rd., Calcutta.
May 26.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

S. B.—We have now looked up the references to production of positives direct by means of thiocarbamide. These are:—"B.J.," October 11, 1912, p. 788 (a brief *résumé* of work by Frary, Mitchell, Baker, Perley and Leighton). "B.J.," November 1, 1912, pp. 840-842 (by Frary, Mitchell and Baker). "B.J.," November 8, 1912, pp. 860-864 (by Perley and Leighton). "B.J.," March 12, 1915, p. 167 (a practical note by F. B. Guilbert). So far as we remember there has not been anything published on the subject since the last paper.

H. H.—For such small negatives it is a comparatively simple matter to arrange a light-box to work either entirely by reflected light or by a mixture of diffused direct light and reflected light. In the former case you arrange the lamps, either inverted mantles or electric, on each side of the negative, the whitened back of the light-box being, say, 5 or 6 ins. from the negative. For incandescent gas the second system is best used with a vertical pattern of camera, the light from one or several mantles being contained in a whitened box and also diffused by a sheet of ground glass placed about an inch above the negative. Although these systems require rather longer exposure than when a condenser is used the results, particularly with retouched negatives, are much better.

J. H.—The formula for the ferro-gallic process given in the "Almanac" works quite satisfactorily, at any rate so long as the paper is used within a fairly short time of being coated. If the whites are degraded to more than a faint bluish tint, the fault is evidently insufficient exposure under the tracing. You will understand that in this process it is necessary to act fully upon all the iron salt which occurs in the ground of the copy when the original is a tracing in opaque lines on tracing cloth or similar material. The bluish-black lines in the copy are formed by the iron salt which is left undecomposed. Therefore, exposure must be continued until the yellow tint of the paper has entirely disappeared from the parts which are to be white in the copy. The process is not suitable for printing from negatives but only from line tracings.

C. E. GREEN.—As an illuminant we do not think anything is better than half-watt lamps. For your studio you would require at least six 1,000 c.p. lamps, or if you want to give very short exposures 1,500 c.p. lamps. These should be arranged in an L shape, four lights in front and two at the side. To get even lighting with a large group, it would be desirable to make the front lamps run on a stout iron rod across the studio so that they could be spread out when necessary. They should also be made to raise and lower, the greatest height to the filaments being 8 ft., and the lowest about 5 ft. 6in. This will allow you to get short exposures with children and sitting figures. The front lamps should be about 8 ft. from the background, and for ordinary single figures or groups of two, the first lamp should be nearly opposite the centre of the background. You can get all particulars from the General Electric Co., Kingsway, W.C. Mention when writing that the lamps are required for photographic work.

K. B.—(1) We do not know a formula without ammonia, but the following is an excellent one for simultaneous development and fixing of ferrotype plates:—

Water, to make	40 ozs. fluid.
Hydroquinone	½ oz.
Soda sulphite	4 ozs.
Soda carbonate	4 ozs.
Hypo	8 ozs.
Liq. ammonia .880	2 fl. ozs.

Addition of more ammonia to the developer gives more vigour. The plates develop (and partly fix) in two or three minutes. They can then be examined in daylight and fixed in plain hypo.

(2) Several chemicals, or mixtures of chemicals, will dissolve the silver image without affecting the undeveloped silver bromide. Potassium or ammonium persulphate is one of these, but the solution most commonly used is a mixture of potassium permanganate and sulphuric acid, or potassium bichromate and sulphuric acid. A formula for the permanganate mixture is that recommended for the "reversal" of Autochrome plates.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. **ESTABLISHED 1854.** **PRICE FOURPENCE.**

TERMS OF SUBSCRIPTION POST FREE.

UNITED KINGDOM OR CANADA.—*One Year*, £1 1s. 8d.; *Six Months*, 10s. 10d.; *Three Months*, 5s. 5d.

ANY OTHER PART OF THE WORLD. *One Year* ..... £1 3s. 10d. *Six Months* ... 12s. 0d. *Three Months* 6s. 0d.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibits the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

HENRY GREENWOOD & Co., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3242. Vol. LXIX. FRIDAY, JUNE 23, 1922. Price Fourpence.

Contents.

SUMMARY.

The last meeting of the Committee appointed under the Safeguarding of Industries Act to inquire into the importation of German optical goods was held on Monday last, when further evidence was given by witnesses for the complainants, and by those for the opponents of the complaint. Mr. A. J. Dennis, of the Houghton-Butcher Manufacturing Co., appeared again to contest previous evidence given by agents for German goods. The Committee's decision will be made known in due course. (P. 371.)

In a leading article we have some hints to give on the arrangement of large groups, and particularly on taking the all-too few opportunities for departing from the customary series of rows. (P. 366.)

We recently received an example of the indifferent psychological insight exhibited by a firm which offers its portraiture free to the public. It is just as well to clothe an obviously invented statement in some pretence of reality. (P. 366.)

Mr. J. C. Elvy, in a letter to the editors, further criticises the recent judgment in the High Court in reference to the supply of electric current at "power" rate for use in photographic studios. (P. 377.)

In the concluding part of his review of recent progress in photographic manufacture and research, Mr. F. F. Renwick deals particularly with theoretical and experimental papers on the latent image and development. (P. 368.)

A contributor, Mr. C. R. Denton, emphasises the revival of view postcards which may be expected to follow the recent reduction of the postal rate to a halfpenny, and adds some hints on the making of view cards for local sale. (P. 367.)

A German experimenter, Dr. Strauss, has suggested a variation of the Ferguson copper-toning solution. He uses oxalate instead of citrate, and adds a small proportion of chromic acid. It is claimed that the mixed bath keeps well. (P. 365.)

The usefulness of the water-bath method of development for subjects having a great range of tones is the subject of a paragraph on page 365. Development is started in the usual way, and the plate transferred to a dish of plain water as soon as the image appears. Excessive density in the high-lights is thus avoided.

A certain reduction in lens speed is produced by the operation of a diffusion adjustment or the use of a separate diffusion attachment. Although almost negligible in practice, it is as well that the tendency of the alteration should be borne in mind. (P. 366.)

A contributor to "American Photography" describes how to fit a single uncorrected spectacle lens for use in making soft-focus effects at an aperture of about *f*/5. (P. 372.)

Plant for the continuous development, etc., of cinematograph film is described in a recent patent specification. (P. 372.)

EX CATHEDRA.

Copper Toning. It might have been thought that every conceivable variation of toning development prints with mineral salts had been tried. Dr. Sellneczek some years ago did a good deal towards exhausting the possibilities, but in the current issue of "Photographische Rundschau" a Dr. Strauss ventures still another variation of the Ferguson copper toning process. He uses oxalate instead of citrate for keeping the copper ferricyanide in solution, and adds a little chromic acid. His formula is: 10 per cent. copper sulphate solution, 5½ drams; 4 per cent. ammonium oxalate solution, 7 ozs.; 20 per cent. potass ferricyanide solution, 5½ drams; 5 per cent. chromic acid solution, 2½ drams; water, 10 ozs. The chromic acid is used as an aid to keeping the whites clean, and the process is said to reduce the contrast of the black print. Considering the presence in the solution of the oxidisable oxalate and an oxidising substance, such as chromic acid, it is rather strange that emphasis should be laid on the keeping qualities of the solution.

* * *

Water Baths for Strong High-Lights At this time of the year it is often found difficult to get good printing negatives of subjects containing very strong high-lights. We refer principally to portraits of persons dressed in white. The negatives obtained are usually hard, and require a large amount of rubbing down, or local reduction, to get printing detail in the strong portions. This can be avoided by care in development, and the easiest method we know is to use the "water bath." The developing solution need not be altered in any way, and one's own pet formula may be used. When commencing to develop a batch of exposures of the subjects mentioned a large dish should be provided, capable of holding say, four or six plates of the size used. This dish should be filled, to a depth of about one inch, with water, and thus constitutes the water bath or "control dish," as it is sometimes called. Let development be started in the usual way and the plate carefully watched for the first sign of darkening action. When this occurs (it is, of course, the highest light, in this case the white frock) the plate is removed to the dish containing water. A slight rock both ways should be given, to remove the surface developer. If this is not done, mottled markings often make their appearance. The dish should now be covered with a piece of card and the next plate put in the developer. When darkening has commenced, this also should be transferred to the water bath, and so on, until the dish is full. The first plate will now be found to be full of detail, and often sufficiently developed to allow of immediate fixation. If, however, the density is not sufficient, the plate is placed back in the developer and development continued until the density is of the required depth. The theory of the process is simple. Developing solution is soaked up by

the dry gelatine, and, when the plate is put into water, continues its action until it is used up. Consequently, in the high-lights it is used up quickly and development stops, while that in the shadows continues active, and has a better chance, than it would have, in a strong solution. Excellent printing negatives can be made in this way, giving full detail in the high-lights, while the shadows are not too thin.

* * *

Diffusion. Neglecting the old mechanical methods, which gave erratic and unsatisfactory results, the portrait photographer has two methods of securing diffusion. One is by altering the lens in some way so as to introduce aberration, the other is by placing diffusion discs in front of the lens; it is worth while considering the drawbacks of each. If the separation of the components of the lens is altered, then will also the focal length be altered, and the more the diffusion, the greater will be the alteration of the focus. Furthermore, the alteration in focal length will produce a corresponding change in the effective aperture, and therefore in the speed, of the lens, since the diameter remains unaltered. In every lens but one on the market the focal length is increased when the lens is set for diffusion, and the speed correspondingly diminished. The alteration in focus may amount to as much as 10 per cent., and in speed, therefore, to 20 per cent., not an alarming amount, but one which is worth considering. The second method, by the use of diffusion discs, does not alter the focal length in any way, and is to that extent preferable, but owing to the introduction of two glass-air surfaces the diminution in rapidity is about 10 per cent., as about 5 per cent. of the light is lost by reflection at a glass-air surface. Moreover, in any diffusion method, since the light, which would normally go to the focus, is deviated, there must be a further diminution in rapidity.

* * *

The Free-Sitting Game. Some portrait photographers, who adopt the practice of offering their work for nothing, must have a very low opinion of the intelligence of the public, or, alternatively, must be singularly lacking in penetration. We had an instance of this a few days ago in the shape of the offer of a free portrait addressed personally to the editor of the "B.J." by an eminent firm in the west end of London. The circular letter starts off by saying that the press department of the studio is frequently being asked for a portrait of ourselves by the editors of the illustrated newspapers. We wonder if the photographers really expect that statement to be believed by us, or by the other members of a certain society, from the membership list of which, as we are able to identify, the address list of their circular letter has been compiled. The people to whom they are writing are by no means in the public eye, and most of them will scarcely relish the doubtful compliment implied by the intimation that their portraits are required for admixture with those of co-respondents, murderers, and shady financiers in the pages of the illustrated Press. But passing from this example of an obvious misjudgment of human nature, we come upon another. If the recipient of the letter happens to be vain enough, or gullible enough, to swallow the bait, he sends a card (provided for the purpose) to make an appointment. We should have thought that it was worth while to acknowledge the alleged favour, which is thus being done by complying with the photographer's request. But not at all. There is the curt intimation that if no acknowledgment is made, the prospective sitter is asked to assume that the appointment has been made as requested. Naturally, like all other literature, touting for free sittings, which we have seen, this circular letter is careful to avoid saying that the photographer acquires the copyright in the portraits and is thereby entitled to use them for any purposes that he chooses.

LARGE GROUPS.

The arrangement of a group containing over a dozen figures does not allow much scope for artistic arrangement, unless the setting is particularly favourable, such as was the case of a Photographic Convention group taken some years ago in Jesmond Dene. This was arranged upon a hill side, the members being more or less scattered among rocks and foliage. Such surroundings are, however, seldom met with, and the most that usually can be done is to make a well-balanced, well-lighted picture of a rather formal arrangement, the nature of which must depend upon the facilities to hand and the number of people to be included.

The photographer must be quick to note any natural advantages of the place and utilise them accordingly. If the background is formed by a building with wide steps ascending to the entrance, the task is a comparatively easy one; successive rows can be arranged one above the other, with the front row seated upon chairs or forms. But there are many cases in which less promising material has to be utilised. As an example of what may be done, the following was the plan adopted in making a series of groups, each containing about forty persons, who were visiting an important building operation. A position was taken up opposite a bank of earth which had been excavated from a part of the works. In front of this, boards were laid upon empty boxes, sacks of cement and any other handy supports, and the front row seated closely so as to hide the contrivance. Behind were two rows, one standing upon the level and the other upon the bank. If the ground had been covered with turf, or mats available, another row could have been seated upon the ground, but wet clay and cinders prevented this being done. Another very large group was managed by borrowing several loads of 3 x 9 deals from a near-by timber yard and piling these so as to form steps. The deals were not cut or nailed, so that they were not spoiled for sale, and the greatest expense was for labour in moving them.

For a group of 30 to 40 members the usual plan is to arrange for four rows, the back one standing upon chairs, forms, boxes or any convenient substitute, the second row standing upon the ground, the third row sitting upon chairs or forms, and the front row sitting as gracefully as possible upon the ground or upon boards supported at a height of about six inches.

In placing the sitters the photographer should always seek the aid of the secretary or other official in charge of the affair, so that the most important personages can be placed in the position of honour; that is to say, the centre of the row sitting at the ordinary height. If it can be avoided, the heads of the back row should not be silhouetted against the sky. But it is not always possible to do this, and therefore it is very desirable that backed plates be used so that the risk of halation is minimised. An efficient shade for the lens should be provided; then, if it is necessary to work facing the sun, all unwanted light can be screened off.

Coming to groups in the studio, the schemes of arrangement will be practically the same; the greatest difficulties which are likely to present themselves are insufficient width and unequal lighting. The former can, to a certain extent, be overcome by arranging for an extra row, or,

as had to be done recently, by taking the group in three sections, joining them to form a panorama, and copying. In this way a party of 120 was photographed in a studio less than 18 feet wide. A convenient way of equalising the lighting is to close the white blinds or curtains of the end nearest the group, so that the light is softened for those nearest the glass. The top and side lights are fully opened at the camera end, and a white background or large reflector placed on the shadow side out of the field of the lens. With this system the lighting will be practically even, right across the plate.

It is very desirable to use a lens having as great a focal length as the space available will allow; nothing is more objectionable than to see the faces of the front row of sitters on a noticeably larger scale than those at the back. Very rapid and consequently expensive lenses are not necessary, since the aperture must be reduced to something between *f*/11 and *f*/22 to obtain the necessary depth, even when the swing-back has been utilised. Hence a lens with a maximum intensity of *f*/8 will do all that is needed. An anastigmat is, of course, to be preferred, but a good rectilinear, if of sufficiently long focus, will cover its normal plate perfectly at *f*/16. If a lens, having a focal length less than the diagonal of the plate, has to be employed, it must be an anastigmat.

The method of identifying the sitters in a large group which is usually practised, is to provide cards, say six inches square, which have large figures from 1 up to the total number of sitters printed or stencilled upon them. After making the exposure, these are handed round, and each member asked to write his name and address upon the back. A second exposure is then made, each person holding the card nearly covering his face. If an order form is attached to the back of the card, this can be filled in, and the cash collected by an assistant.

Lately, panoramic cameras which will embrace a very wide angle have been largely used for this class of work, but a word of caution is necessary as to the choice of a background. If this be foliage, the effect will be good, but the rendering of a building is sometimes very unpleasant; there is the tendency for a perfectly flat facade to look as if it were strongly convex towards the sitter.

PROFITABLE POSTCARD PHOTOGRAPHY.

The reduction of the postal rates is likely to have the effect of increasing the public demand for view postcards, and several manufacturers of these are anticipating this demand during the coming holiday season. The popular holiday resorts and the large towns are well covered by these firms, who have their special photographers, sent to deal with likely subjects, and the local professional or the advanced amateur who contemplates this work as a side-line will not have much chance in competing with these firms unless he can produce cards which are really novel and original.

Apart from the popular resorts and beauty spots, there are many small towns and villages in Great Britain which are more or less neglected by the postcard firms, and these offer a good chance for the enterprising individual. Apropos of this, the writer one day was talking to a newsagent in a small town which was not a holiday resort, but merely a commonplace industrial area. The man said:

"I find it rather difficult to get really good photographic postcards of local views."

"Why is that?" he was asked.

"Most of these were supplied by German firms before the war; and since then no one seems to have done anything in the matter. The demand is there right enough, because many people ask me for them."

It is quite likely that the enterprise of Germany will again extend itself into this phase of British industry as soon as conditions are favourable, and it is up to the British photographer to see that a possible field of profit is not taken away from him. Most of us remember these German "pictorial" products; even the most inartistic photographer amongst us could produce something better than them. And I venture to think that the general public taste is improving, and that there is a growing demand for more tasteful articles, and amongst them more tasteful photographic postcards.

The market problem is the first thing to consider, however, because it is not much good supplying goods which are not wanted. The photographer should have a talk with his local stationer or newsagent on the subject. The latter may already have a supply of view cards, but if the photographer can offer, or, better still, show, him something better he is likely to get future orders.

The photographer who lives in the district has a distinct advantage over those publishing firms who send their own photographers out on tour to obtain negatives. He knows the country-side better, and the most interesting spots will be so familiar to him that he can select the best view-points and the best lighting before he makes his exposures. Most touring photographers have time only for a hasty selection before they pass on to the next district.

This point was brought home to me rather forcibly by a collection of some thirty or forty postcards of a beautiful district. The photographer had motored over about twenty miles, and had taken all his negatives on the one day without any previous selection. About five of the pictures were really good enough to make attractive and saleable postcards, and the rest were failures chiefly because a bad or indifferent view-point had been selected.

If the photographer has not done much landscape or artistic work of an outdoor nature he should take some pains to study the principles of composition before he begins. If he studies some of the excellent etchings of towns and of landscapes which are now so popular, and compares these with the commonplace view-cards more often turned out, he will soon be convinced that a little artistic discrimination makes a huge difference. In passing, it may not be out of place to comment and hold up as example to be studied the really beautiful landscape cards and souvenirs of the Lake district by Mr. Abraham, of Keswick. Some of these are worth getting as examples to study. True, he has beautiful landscapes to photograph, but much of this effectiveness depends upon the view-point and the lighting.

Except when the subject is of unusual interest, view negatives without human figures should be avoided. Figures give a touch of life to a scene. They must be very carefully included when the exposure is made so that they fit in with the composition, and harmonise with the subject. In street scenes especially, they should not be photographed when too near the camera unless they are posed for that purpose; and care is necessary to avoid including the eternal man who will stride right across the foreground and be photographed in that ugly attitude with his legs wide apart.

The technique of exposure and development, of course,

should be beyond reproach both for the sake of the photographer's reputation and his final profit.

A good modern half-plate camera fitted with an anastigmat lens and roller-blind shutter is a very suitable type to use. The picture postcard above all is purely a typographical record of a particular part of a town or district, and it should be as clear, sharp, and bright as it can be made It is not advisable, however, to step down to *f*/64, as the old-time landscape photographer used to do, for there is plenty of opportunity to sell a higher standard postcard which is both artistic and yet possess good delineation.

Unless the photographer is very well equipped for the purpose it is not wise to print the actual cards himself. The best way is to obtain the negative and send this to one of the trade houses who specialise in postcard printing, and who will print any quantity of calotype postcards of each subject which can be done in various tones and styles according to the taste of the producer.

In this article the writer has attempted to point out the opportunities of this class of work to the small professional. Those who think it worth while can study the question of supplies and profit according to local conditions. It is a good plan, however, to work for a large sale with smaller profits rather than a big profit on each and a limited sale. This enables the photographer to produce new negatives more quickly and gives him the chance of introducing new features before the others have time to get old and worn. There is nothing like freshness and novelty even in postcard production; people soon get sick of seeing the same thing too often.

CHARLES R. DENTON.

PHOTOGRAPHIC MATERIALS AND PROCESSES.

[REGULARLY each year the Society of Chemical Industry renders a valuable service to those connected with the manufacturing and scientific sides of photography by including in its "Annual Reports" one on photographic materials and processes. The report for the year 1921 is written by Mr. F. F. Renwick, F.I.C., whose large share in photographic research qualifies him exceptionally as a recorder of recent investigations in the technical improvement of processes of making negatives and positive prints, orthochromatics and colour photography, cinematography, and photo-mechanical processes. The report exhibits the work which obtained publication last year in its relation to previous knowledge better than any other communication which comes before the photographic industry, for which reason we endeavour to find a place for it in our pages. As regards the references to original sources of publication, it should be explained that the contraction "J" denotes the fortnightly "Journal" of the Society of Chemical Industry, in which are published abstracts of the chief papers dealing with the chemical side of practical, scientific, or industrial photography.]

(*Continued from page* 357.)

Reactions of Photographic Images.

A. Steigmann[64] during the past two years has investigated the applicability of the hydrosulphites to various photographic purposes (developing, silver recovery, etc.) but finds them of no great value in most cases, though convenient for recovering the silver from old fixing baths and incidentally regenerating them.

The process of photographic reduction by means of persulphates has received a large amount of attention. Lumière and Seyewetz[65] reaffirm their view that the selective action of these reagents on the denser parts of the developed image is due to the tendency to reversal of the initial solvent action when the silver sulphate first formed is in presence of excess of persulphate, photographic reduction (silver removal) being thereby confined to the deeper layers of the film. They do not accept Sheppard's view that the irregularities met with are attributable to variations in iron content and state that for regular action a definite free acid content of $\frac{1}{4}$—$\frac{1}{2}$ per cent. is alone necessary unless chlorides, which are particularly potent in modifying the action, are present. A valuable historical summary of previous work on persulphate reduction has been published by G. I. Higson, with a very full bibliography.[66] Lastly, a valuable series of new experiments on the subject and a detailed discussion of their probable explanation which has just appeared in a paper by S. E. Sheppard,[67] confirms Lumière and Seyewetz' observations on the importance of the acidity of the solution, and sets the whole matter in a somewhat clearer light.

A useful paper by L. A. Jones and C. E. Fawkes[68] deals quantitatively with the effects of ten different photographic reducing agents upon developed images on paper.

The high degree of permanence attaching to sulphide-toned silver images and the beauty of some of the brown tones so obtained has attracted several workers to the study of sulphide toning processes and, as a natural extension, to the working out of methods of toning with selenium and tellurium.

Lumière[69] claims the use of thiophosphates as sulphiding agents, having the merit of being odourless. The theory of sulphide toning in the hypo-alum bath is partly elucidated in a paper by H. Freundlich and A. Nathansohn,[70] and in a recent paper before the Royal Photographic Society, by S. O. Rawling,[71] the former showing that colloidal sulphur is able to combine directly with colloidal silver, and the latter that at a moderately elevated temperature the same reaction can take place with the silver of a developed print.

A detailed study of the effects of varying the compositions of the bleaching and sulphiding baths and other details of manipulation has been published by E. R. Bullock.[72]

Namias[73] has published several new formulæ for toning with selenium, and a number of patents for selenium and tellurium toning baths have been taken out by German firms.[74] H. Franke[75] has patented a process of intensification by means of selenium.

A new printing process has been patented by the Badische Anilin u. Soda Fabrik.[76] When benzidine or other diamine compound is precipitated with an acid dye (*e.g.*, Eosin, Cyananthrol, Neptune Green, or Quinoline Yellow S) an insoluble compound is formed which in the presence of manganese nitrate or other suitable oxidising agent bleaches in the light. According to the base and the acid dye selected, prints of a large variety of colours are obtainable having good gradation and vigour. Fixing is done in borax or sodium phosphate. Pure whites have not yet been obtained and printing is very slow, but the process appears to be worth further study.

Miscellaneous.

An interesting paper by J. Rheinberg[77] draws attention to the change in permeability to alcohol of certain colloid films containing ferric ammonium citrate after this salt has been reduced by

64. A. Steigmann, *Kolloid-Zeits.*, 1920, **27**, 249; **28**, 29, 175; *J.*, 1921, 164A, 395A. *Phot. Ind.*, 1921, 379.
65. A. and L. Lumière and A. Seyewetz, *Brit. J. Phot.*, 1921, **68**, 124.
66. G. I. Higson, *Phot. J.*, 1921, **61**, 237.
67. S. E. Sheppard, *Phot. J.*, 1921, **61**, 450.
68. L. A. Jones and C. E. Fawkes, *J. Franklin Inst.*, 1921, **191**, 503; *J.*, 1921, 370A.
69. A. Lumière, F.P. 507,332.
70. H. Freundlich and A. Nathansohn, *Kolloid-Zeits.*, 1921, **29**, 16.
71. S. O. Rawling, Royal Photographic Society Meeting, Nov. 8, 1921.
72. E. R. Bullock, *Brit. J. Phot.*, 1921, 447; *J.*, 1921, 639A.
73. R. Namias, *Il Prog. Fot.*, 1921, **28**, 14.
74. Chem. Fabr. auf Aktien (vorm. E. Schering), G.P. 335,627; *J.*, 1921, 562A. Kraft und Stendel, G.P. 334,172 and 337,820; *J.*, 1921, 413A, 639A. Mimosa A.-G., G.P. 337,869; *J.*, 1921, 639A. E.P. 169,378.
75. H. Franke, G.P. 333,094; *J.*, 1921, 371A.
76. Badische Anilin u. Soda Fabrik, G.P. 337,173; *J.*, 1921, 639A. See also J. M. Eder, *Brit. J. Phot.*, 1921, **68**, 658.
77. J. Rheinberg, *Phot. J.*, 1921, **61**, 120; *J.*, 1921, 239A, 603A.

exposure to light. This phenomenon is the basis of his patents relating to a multicolour screen suitable for colour photography (*vide* J., 1913, 1116; 1914, 513, 637). It is to be expected that a variety of useful applications could be found for this remarkable property of such exposed films.

A new type of electric lamp, "Osglim," is being put on the market by the General Electric Co., having interesting possibilities for dark-room illumination. The light emitted arises from an electric discharge between electrodes in a bulb filled with neon, or neon and mercury vapour. Although the candle-power per watt is very low, recent experiments in the laboratories of Ilford, Ltd., have shown that with suitable safelight screens they are more efficient for dark-room illumination than ordinary metal filament lamps, besides having a long life and generating very little heat, the consumption being only 5 watts per lamp. [Further experiments by B. V. Storr mentioned in a paper before the Royal Photographic Society ("Phot. Journ.," June, 1922, p. 271) have confirmed this statement only for those cases where the illumination must be very weak. For ordinary dark-rooms, for development and such like purposes where comparatively bright light is permissible, the total light obtainable from an Osglim lamp is too small.—EDS., "B.J."]

Theory.

A number of papers of a mathematical nature dealing with the various characteristics of silver bromide emulsions has appeared. In view of the number and complexity of the factors involved, it is unlikely that a mathematical solution embracing all such emulsions will prove possible, so that while a thorough study of all these factors and their inter-relations is highly desirable and is indirectly valuable both to the manufacturer and to those who use dry plates for quantitative work, it would not repay users to determine the "constants" in the very complex equations suggested for the characteristic curve by Ross, Helmick, or Slade and Higson.[78]

The Hurter and Driffield method of determining the "inertia" of a plate is well known to give results of an unreliable character if used alone as a criterion of sensitiveness, because of the considerable variations among commercial plates in the relative lengths of the lower and the middle, approximately straight, parts of the characteristic curve and the uncertainties arising from variations in the amount of chemical fog in different plates and for different times of development. Moreover, in all photometric work in which light-intensities are to be deducted from their effects on photographic emulsions, the greatest care has to be exercised to avoid numerous possible sources of error even when adopting the apparently simple method of comparing the unknown with a series of known values recorded on the same plate or film, so that to rely on values deduced from a formula would be practically useless.

In two important papers G. I. Higson[79] makes an ambitious attempt to reconstruct the Hurter and Driffield characteristic curve by reasoning based on Slade and Higson's paper on the photochemical law of the silver halide grain published last year. While the mathematical reasoning in these papers has met with severe criticism[80] and is based on assumptions difficult in some cases to justify, it is important to note that Slade and Higson's experimental work, showing that "under ordinary conditions of exposure (for times over about $\frac{1}{100}$-sec. and with white light) and with most plates on the market, the density is proportional to the square of the exposure in the under-exposure region" has been confirmed by F. C. Toy.[81]

The experimental section of Higson's second paper merits careful attention from all workers in sensitometry, and lends considerable support to the mathematical introduction.

Methods of sensitometry, based on the properties of neutral optical wedges, are rapidly coming into general use, both in this country and on the Continent. In connection with them a paper by G. I. Higson is a useful addition to the literature of the subject.[81]

A new and rapid method of determining absolute reflection coefficients as the result of two observations only has been worked out by A. H. Taylor[82] and independently by C. H. Sharp and W. F. Little,[83] while the former has devised for the purpose a very ingenious portable instrument which should prove a valuable addition to the equipment of any laboratory concerned with the photometry of paper or other reflecting surfaces, prints, etc.

Several suggestions to employ self-luminous mixtures of radioactive and fluorescent substances as a rough standard of light have been made: (*a*) for the preparation of sensitometric tablets,[84] (*b*) as the comparison source in an actinometer.[85]

Photochemistry of Silver Salts.

Two papers have appeared dealing quantitatively with the photochemical decomposition of silver bromide in strong illumination. In the first, by W. Ehlers and P. P. Koch,[86] finely-divided dry silver bromide particles were "weighed" in an Ehrenhaft-Millikan condenser and found to show a slight gain in an oxygen-containing atmosphere and a loss (reaching 10 per cent. for the smallest particles) in an atmosphere of nitrogen when exposed to a strong light. It is deduced from calculations based on these results, *obtained under very different conditions*, that in the photochemical decomposition of highly sensitive silver bromide by weak light a loss of weight occurs corresponding to approximately 1 Br atom per particle of AgBr. The second paper, by R. Schwarz and H. Stock,[87] deals with the rate of elimination of bromine from wet precipitated silver bromide when exposed to daylight in three different states of aggregation, obtained by adding excess of a potass. bromide solution to an acid silver nitrate solution, and from a fourth variety obtained when excess of silver nitrate was employed. Considerable variations in sensitiveness were observed between the different specimens. The curves connecting the average rates of loss of bromine per hour with the logarithms of the average light-intensities during exposure are said to be similar in type to the characteristic curves of photographic emulsions. Beyond a certain average intensity of illumination a sharp fall in the average rate of loss of bromine was observed, and consequently it is asserted that solarisation is accompanied by a diminution in the rate of its elimination. In view, however, of the difficulties invariably found in making a number of separate preparations of similar sensitiveness on a small scale, the results are of doubtful trustworthiness while, in any case, the above curves do not show the course of the reaction during its progress for any given preparation and for a given light intensity as does the characteristic curve of a plate.

Further studies of the effects of coloured lights on the photochlorides of silver by F. Weigert[88] emphasise once again the marshalling action or regimentation which light waves exert on ultramicroscopic particles, while a new method of preparing silver sols having particles of known dimensions which has been worked out by K. Schaum and H. Lang[89] is a valuable contribution to the question of the relations between colour and size of particle in such complexes, a subject which is discussed by F. Formstecher[90] in its bearings on chlor-citrate print-out processes.

It is being urged by some prominent scientific workers that all chemical reactions and changes of state are initiated by radiation.[91] Confining ourselves to generally acknowledged photochemical changes, however, it certainly seems necessary in all cases to assume that the absorption of light energy leads to a liberation of latent valencies (electrons), or some activation of the molecule, as the initial step in the process, the succeeding stages depending chiefly on the nature of the neighbouring molecules.[92]

The writer's suggested modification of the silver germ theory of the latent photographic image has been criticised by Lüppo-Cramer[93] and S. E. Sheppard,[94] who are both of the opinion that the suggested photoelectric discharge of negative electrons from colloidal

78. P. E. Ross, *Astrophys. J.*, 1920, 201; *J. Brit. Astr. Assoc.*, 1920, *31*, 25; *J. Opt. Soc. Amer.*, 1920, *4*, 255; *J.*, 1921, 323A. P. S. Helmick, *Phys. Rev.*, 1921, *17*, 126; *J.*, 1921, 239A. H. E. Slade and G. I. Higson, *Proc. Roy. Soc.*, 1920, *A 98*, 154; *J.*, 1921, 27A.
79. G. I. Higson, *Phot. J.*, 1921, *61*, 35, 144; *J.*, 1921, 99A, 239A.
80. L. Silberstein and S. E. Sheppard, *Phot. J.*, 1922, *62*, 205, 206, 253; *J.*, 1921, 324A.
81. F. C. Toy, *Proc. Roy. Soc.*, 1921, *A 100*, 109.
81. G. I. Higson, *Phot. J.*, 1921, *61*, 93; *J.*, 1921, 163A.

82. A. H. Taylor, *Bull. Bur. Stand.*, 1920, *16*, 421, and *Scient. Paper No. 391*; *Bull. Bur. Stand.*, 1920, *17*, 1; *Scient. Paper No.* 405.
83. C. H. Sharp and W. F. Little, *Trans. Ill. Eng. Soc. Amer.*, 1920, 802.
84. E. Huse, *Eastman Kodak Res. Lab. Rep. No.* 1162.
85. C. C. Howenstine, U.S.P. 1,361,999. F. J. Hargreaves, F.P. 519,081.
86. W. Ehlers and P. P. Koch, *Z. f. Physik*, 1920, 169; *J.C.S. Abst.*, 1921, *120*, 289.
87. R. Schwarz and H. Stock, *Ber.*, 1921, *54*, 2111; *J.*, 1920, 791A.
88. F. Weigert, *Ann. d. Physik*, 1920, *63*, 681; *Kolloid-Zeits.*, 1921, *28*, 115, 153.
89. K. Schaum and H. Lang, *Kolloid-Zeits.*, 1921, *28*, 243; *J.*, 1921, 561A.
90. F. Formstecher, *Phot. Ind.*, 1921, 439, 455, 590.
91. Faraday Society, Discussion on Chemical Change and Catalysis, Sept. 28, 1921; *J.*, 1921, 367R. See also Brit. Assoc. Address, Prof. O. W. Richardson, *Nature*, 1921, Nov. 17, 372.
92. P. R. Kögel, *Phot. Korr.*, 1920, *57*, 308; 1921, *58*, 65.
93. Lüppo-Cramer, *Phot. Korr.*, 1920, *57*, 259, 285.
94. S. E. Sheppard, *Brit. J. Phot.*, 1921, *68*, 4.

silver held in solid solution in silver bromide (resulting in electrically neutral silver gel particles) is improbable. In this connection it is of interest to note H. P. Stevens' observations[95] on the rapid (and reversible) change of certain rubber sols into gels on exposure to light, while to the writer it seems inconsistent of Lüppo-Cramer[96] to attribute the fogging action of certain basic dyes and neutral salts to the neutralisation of the negative electric charges on the silver amicrons supposed to be formed in the ripening process and yet to deny the possibility of light bringing about the developable condition by the removal of these electric charges.

M. Volmer[97] assumes that by the action of light a change in the silver bromide grains arises at individual points, resulting in differently attached silver atoms, while Sheppard and Trivelli[98] suggest that "some degree of migration and oriented concentration of the silver cations will occur in the silver halide crystal lattice which will favour the essential photochemical change, i.e., $Br'.Ag \rightarrow Br \times Ag$; in words, the passage of an electron from a bromine ion of the lattice to a silver ion"; they promise to discuss the energy relations later. The crux of the problem lies in the deficiency of energy for the effects produced, and in this respect it is on all fours with the difficulties discussed by Prof. O. W. Richardson[91] in his recent Presidential address to the British Association.

Theory of Development.

In March, 1920, the writer[98] called attention to the catalytic nature of the process of chemical development and pointed out the possibility that the effect of a reagent which apparently "destroyed" the latent image might in some cases be due to "poisoning" of the catalyst formed by light instead of its removal by solution or transformation into a new chemical compound.

The catalytic character of the development process forms the theme of the paper by M. Volmer[97] cited above. He emphasises the difficulty of accepting the older idea underlying the silver germ theory of the latent image, according to which there was no essential difference between chemical and physical development except in the origin of the deposited silver, the original nucleus in either case growing by accretion as the silver gets thrown out from a supersaturated solution.

On the catalysis theory of chemical development, however, the silver bromide grains are rapidly reduced *in situ* as a result of contact catalysis, the processes of solution, reduction to silver, and its deposition being accomplished without bringing into play the transportation of supersaturated silver solutions outside the ambit of the individual grain. A paper by A. Steigmann[99] also clearly brings out the distinctions between the two modes of developing a latent image.

Sheppard and Meyer[100] have previously advanced the opinion that reduction of the silver bromide grain is preceded by adsorption of the reducing agent and takes place in the breakdown of this adsorption complex, the process being accelerated or initiated by the latent image as silver nucleus. In the paper already cited this is amplified.

In the light of the accelerating effects already referred to (of phenosafranine on quinol developers and the mere dilution of some other developers) it is clear that differences in the initial rate of attack, on which the old arbitrary distinction between "slow" and "rapid" developers was chiefly based, are a very uncertain index of the relative energies of different agents. While we must admit the formation of more easily reducible adsorption complexes in the cases above mentioned, and in many other similar phenomena, some unpublished experiments of the writer's show that exposed plates bathed for 1 minute in 1 : 1000 neutral solutions of Chrysoidine or Patent Blue are developable only with extreme slowness in most developers, thus demonstrating the possibility of "poisoning" the catalytic activity of the latent image by the formation of an adsorption complex with the silver halide of quite the opposite character. In these cases also the effect varies in degree with the reducing agent employed and is sufficiently powerful with quinol and some substituted quinols to make development practically impossible. Removal of the dye by prolonged soaking in suitable baths (weak acetic acid for Chrysoidine and weak alkali for Patent Blue) restores the capacity for development.

That the catalytic activity of the latent image may be poisoned similarly by mercuric chloride is suggested by A. St. H.[101] to account for the "destructive" action of this salt when intensification of the latent image might have been expected.

In connection with catalytic reactions of this kind, it would be well worth while to investigate in a scientific and quantitative manner the well-known catalytic accelerating actions of traces of lead, bismuth, and mercury salts in the development of cold-bath platinotype paper, while the extraordinarily powerful poisoning action of tartar emetic on this development reaction (writer's observation, not previously published) is of considerable interest.

E. C. C. Baly and his co-workers[102] have published two important photochemical papers during the year, the first dealing with the mechanism of the combination of hydrogen and chlorine on illumination, and the second with the photo-synthesis of formaldehyde and carbohydrates from carbon dioxide and water. In the former paper strong arguments are adduced in favour of the view that the cause of the considerable deviation from a simple proportional relationship between the reaction velocity and the light-intensity is due to the re-absorption by the reactant molecules (uncombined chlorine and hydrogen) of the energy radiated by the hydrogen chloride in process of formation, with the result that many more of the former become activated than would otherwise be the case. In this, and more fully in the second of the above-mentioned papers, a new hypothesis to account for photocatalysis (colour sensitising) of a photochemical reaction is suggested. According to Baly a photocatalyst must contain the same elementary atoms as the light-sensitive substance or must form a compound or complex with it, but although he states that the sensitisation of photographic plates to red and yellow light can probably be explained on these lines he does not discuss the subject further. At present we have no real foundation on which to build up a theory of colour-sensitising for we do not know what factors are indispensable. Most workers believe that there must be some sort of union or adsorption between the dye and the silver halide, but it is evident that it may be a very loose connection since the considerable blue-sensitiveness conferred on silver chloride by Auramine is readily removed by washing out the dye with water only. Baly's views on this subject are far too general in character to be of any assistance to photographic chemists at present in the search for efficient sensitisers.

It has now become almost impossible for any one worker in photographic science to appreciate at their true value, or even to follow closely, the advances being continually made in the many fields of inquiry from which photography daily draws fresh inspiration, but if this report achieves its purpose, even in a minor degree, it cannot fail to indicate something of the diversity, difficulty, and fascination of the subject.

F. F. Renwick, A.C.G.I., F.I.C.

FORTHCOMING EXHIBITIONS.

June 1 to 30.—Royal Photographic Society. Prints by Pirie Macdonald, of New York. Open daily from 11 to 5 p.m., 35, Russell Square, London, W.C.1.

August 26 to September 9.—Toronto Camera Club. Latest date for entries, July 22. Secretary, J. H. Mackay, Toronto Camera Club, 2, Gould Street, Toronto, Canada.

September 9 to October 7.—London Salon of Photography. Latest date for entries, August 30. Particulars from the Hon. Secretary, London Salon of Photography, 5a, Pall Mall East, London, S.W.1.

September 11 to 15.—Professional Photographers' Association, Princes Galleries, Piccadilly, London, W. (Trade and Professional). Hon. Secretary, Richard N. Speaight, 157, New Bond Street, London, W.1. Also foreign invitation loan exhibition of professional portraiture. Hon. Secretary, Marcus Adams, 43, Dover Street, London, W.1. Latest day for entries and exhibits, August 31.

September 18 to October 28.—Royal Photographic Society Annual Exhibition. Latest date for Entries, August 25 (carrier); August 26 (hand). Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

---

95. H. P. Stevens, *J.*, 1921, 187T.
96. Lüppo-Cramer, *Die Phot.*, 1921, No. 9; see also "Kolloidchemie u. Photographie," 2nd ed., p. 108.
97. M. Volmer, *Z. wiss. Phot.*, 1921, *20*, 189; *J.*, 1921, 239A.
98. H. F. Renwick, *J.*, 1920, 156T.
99. A. Steigmann, *Phot. Ind.*, 1921, 550.
100. S. E. Sheppard and G. Meyer, *Phot. J.*, 1920, *60*, 12.
101. A. St. H., *Phot. Ind.*, 1921, 296.
102. E. C. C. Baly and W. F. Barker, *Chem. Soc., Trans.*, 1921, *119*, 653. E. C. C. Baly, I. M. Heilbron, and W. F. Barker, *ibid.*, 1921, *119*, 1025.

GERMAN SCIENTIFIC INSTRUMENTS.

Importation of Optical and Photographic Goods.

The Committee set up by the Board of Trade to inquire into the importation of optical instruments, including cameras, from Germany, and the desirability of imposing an additional duty under the Safeguarding of Industries Act, was concluded on Monday last, June 19. The two previous meetings have been reported in the "B.J." of May 19 and June 9. Sir Henry Rew again presided, and Sir Arthur Colefax led for the complaining parties, and Mr. T. W. H. Inskip for the parties resisting the application. The meeting of the Committee was held in the Old Hall of Lincoln's Inn, and the great picture by Hogarth, representing "Paul before Felix," looked down upon all concerned.

At the outset, Mr. Inskip, on behalf of those resisting the application, called evidence from Major A. G. Church, general secretary of the National Union of Scientific Workers, who stated that his union had circularised various bodies with a view to investigating the complaint that the effect of the Safeguarding of Industries Act, the Dyestuffs Importation Act, and the German Reparation (Recovery) Act had been to increase the costs of research. He gave particulars of some researches which had been delayed or abandoned, and claimed generally that the Safeguarding of Industries Act, as at present framed and operated, was hindering and hampering those very activities of the nation which were vital to its industrial supremacy and its security. The supply of glassware was in many respects still very imperfect. Porcelain ware often exploded with heat, and the glass apparatus obtainable was often not properly annealed, not uniform in character, and of the wrong shape. The large Dewar vessels, which were urgently required, were unobtainable in this country. No great difficulty was experienced in obtaining the commoner types of instruments, such as microscopes and balances, though the quality was not uniform.

Mr. S. Segal gave some evidence, the purport of which was to urge that every article coming from Germany should be listed in pounds sterling, not in marks, and then, he said, the British manufacturers would be protected. A member of the Committee pointed out that it would still be possible for German manufacturers to manipulate the prices in their catalogues. Goods of well-known makes, with good reputations, such as Zeiss, Goerz, and Busch, were being improperly imported at extremely low prices, and there was only one remedy for this, namely, importation at the manufacturers' catalogue prices. There were not more than a dozen well-known makers in Germany, and each port should be furnished with manufacturers' catalogues, or the Germans should be made to declare that the goods were sold at catalogue prices, and in this way the British manufacturer would be protected against the influx of German articles at such low prices as some of the importations to-day.

Some rebuttal evidence was then called by Sir A. Colefax. Mr. Conrad Beck stated that a Zeiss microscope which corresponded to a British-made microscope, sold in this country for £30 10s., could be purchased retail in a shop in Germany for £11 2s. 10d., and even with the reparation duty added, the price was only £13 16s.

Mr. Watson Baker put in a recent letter in which 100 pairs of Zeiss prism binoculars, 6 × 30, silver mounted, were offered to the trade at £6 per pair delivered in London. In another letter of earlier date (June, 1921), 5,000 pairs of Zeiss field glasses, 8 × 24, guaranteed absolutely new, were offered at £4 each c.i.f. London. Asked whether he thought the German manufacturers were trying to get their goods on the market at the undercutting prices, or whether, as one previous witness had suggested, they were doing their best to stop the practice, he expressed the view that they were indifferent.

Mr. A. J. Denniss, works director, Houghton-Butcher Manufacturing Co., contested some statements made by Mr. Peeling at the previous sitting. It had been said that there was no British camera competing with the C.D.V. Goerz; there was such a competitive camera in the shape of the Newman and Guardia "Sibyl." Mr. Peeling had said that the Houghton-Butcher firm made a great many more plate cameras than film cameras. The witness handed in an analysis of the output of his firm for the years 1913, 1914, 1920, and 1921. In 1913 the total output of roll-film cameras was 56,175, and of plate cameras 22,514, in 1914 the total output of roll-film cameras was 40,687, and of plate cameras 22,481. The figures for the later years were not stated in public, but the ratio at the present time was just over six roll-film cameras for every plate camera produced. Mr. Peeling had stated that the British manufacturers did not produce lines which were in popular favour. He could only think that Mr. Peeling had made that statement out of his ignorance concerning British makes. Mr. Peeling had also referred to French and American competition. French competition was negligible, and American competition was outside the province of the Committee. Mr. Denniss went on to say that Messrs. Zeiss were now giving their agents commission on quantities sold, and not on values, a reversal of their former practice. This went to prove that they were contemplating a considerable reduction in price.

Mr. Inskip said that he was informed that the bonus was on the number sold, and the discount on the value.

Mr. Denniss went on to remark that at the previous hearing, while Mr. Atha, Messrs. Zeiss' agent in this country, was giving his evidence, a very high official from Carl Zeiss was sitting behind him, who could have thrown light on some of the questions which were described as technical works details, had it been desired that such information should have been supplied. Mr. Peeling had also stated that there was no justification for the British camera being priced so high. But the house of Goerz, for which Mr. Peeling was agent, was identified with the Goerz-Anschutz camera, perhaps the best-known Press camera in the world, and when the war broke out, this camera being unprocurable, a British Anschutz of identical build was brought out, and, fitted with an $f/4.5$ lens and three dark slides, was sold for £30 10s., whereas the corresponding German camera was sold for considerably less—namely, £25 2s. 3d. —which suggested that those concerned for the Goerz productions thought that there was some justification for a camera being sold in England at a higher price. Mr. Denniss added that his firm was not at all antagonistic to these agents for German houses; they were only distributors, and their output was such that they were not really competitive at all. But his firm had its own intelligence department, and he believed that the policy which German manufacturers contemplated was direct sale in this country, and that presently, by the institution of London houses of the German firms in question, the agents would be thrown overboard. Mr. Peeling, again, had suggested that the Houghton-Butcher firm was over-capitalised. Mr. Denniss showed that its turnover was over a million in 1919, and nearly a million and a half in 1920. With regard to the evidence of Mr. Hunter, who had said that certain German cameras got their leather from Nottingham, it was only the leather for the bellows which was so obtained, the other parts not being real leather, and the average cost of leather for making the bellows for a quarter-plate camera was only 9d. It was not his allegation that German cameras were sold at a price below the cost of production, but simply that the German workman was paid in marks the equivalent of 4d. an hour, which made proper competition impossible. He produced a Contessa-Nettel camera, sold in the ordinary way at £2 12s. 6d. at a London stores, and embossed with the name of the stores.

Mr. Inskip said that this camera was supplied to the stores in question by the agent for these German goods, and the reason that the price was below what had been stated for this line of cameras was because the lens was of a less expensive type.

Mr. Denniss said that it was of the same aperture as the others, and the test of a lens was the aperture.

Further rebutting evidence was called by Sir A. Colefax with regard to drawing instruments and ophthalmic lenses, and then the taking of evidence was concluded. Sir A. Colefax and Mr. Inskip addressed the Committee, the one on behalf of the applicants and the other on behalf of those resisting the application. The former, after reviewing the evidence, maintained that a case had been made out for additional duty, and the latter urged that what was complained of, so far as it had any substance at all, was due to temporary conditions, such as the liquidation of accumulated stocks during the war.

The decision of the Committee will be made known in due course.

Edinburgh Photographic Society.—The following changes have been made in the officers:—Mr. McKechnie retires from the presidency in rotation, and is succeeded by Mr. E. F. Spaven; Mr. G. Massie retires from the secretaryship, after long service, and is succeeded by Mr. R. S. Galloway; Mr. N. Ramsey McPherson has resigned the treasurership to take up an appointment in Melrose, and is succeeded by Mr. T. A. Mowat.

A SPECTACLE LENS FOR SOFT-FOCUS EFFECTS.

(A note in "American Photography.")

Possibly this article will be useful to those pictorialists who wish to obtain soft focus effects, but who do not feel that they can afford to pay the price which semi-achromatic lenses usually sell for. Then, too, many advanced workers, who perhaps own one lens of this type, would like several of different focal lengths, which could be placed as desired in the same lens tube.

Of course, it must not be supposed that such a lens as the one about to be described will produce the same effects as the high-priced lenses which are now on the market, but anyone who experiments with this lens will be surprised with the pleasing results obtained with it.

First, procure from an optician or dealer in optical goods a spectacle lens, described as Meniscus (round), 47 millimetres focus, plus 4.50, curve 0. This will cost very little; the writer purchased one, several years ago, for 25 cents each, but they may cost somewhat more now.

These lenses come in all focal lengths, so the pictorialist, with little expense, may have quite a variety, but the one described is nine-inch focus, and perhaps a good one for average work.

Having got the lens, however, the next thing is to mount it in a shutter or tube; it may be that you have an old one which will answer this purpose, but if not, a suitable one can be made of brass or tin, or even cardboard. The tube made and used by the writer

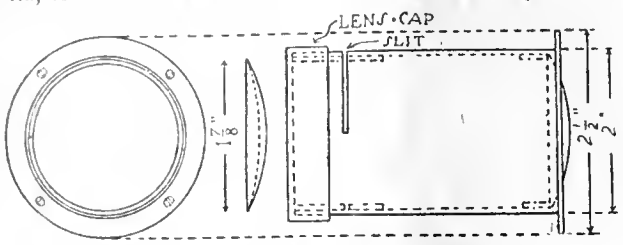


Fig. 1.

is of tin, and, while not as nice looking as brass, is very durable. Do not let the matter of a lens tube prevent you from fitting up such a lens, as a cardboard one will answer very well, and costs nothing but the time of making it.

The inside of the tube should be $1\frac{7}{8}$ ins. in diameter, or just large enough for the lens to slip in. A slot must be sawed or cut crosswise, and half-way through the tube, in which the stops or diaphragms can be slipped.

At the back of the tube a flange $2\frac{1}{2}$ ins. in diameter should be fastened, to hold the tube to the lens-board. The inside diameter of the flange should be $1\frac{3}{4}$ ins., or smaller than the diameter of the lens, so as to keep it from coming out of the back of the tube. The lens is now placed in the back of the tube with the convex side out (fig. 1), and a ring of flexible cardboard is glued in to hold it in place. A ring of cardboard is glued in from the front of the tube to the diaphragm slit, and another strip about $\frac{1}{2}$ in. wide is glued on the other side of the slit, thus leaving a small space, which holds the diaphragms in place. The interior of the tube is now painted dull black, or lined with black velvet, to reduce reflections.

Some diaphragms will be needed, and two or three will be sufficient. These are made of thin metal, such as brass or tin, preferably, but can be made of Bristol board. The focal length of the lens described is approximately 9 ins., and it should cover a 5 x 4 or 7 x 5 plate. The lens at full opening works at about $f/5$ or one-fifth of its focal length, which is rather fast; it gives a very soft image. The other diaphragms can be $f/6$, with $1\frac{1}{2}$-in.

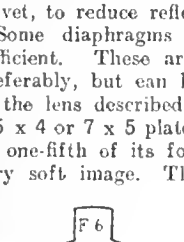


Fig. 2.

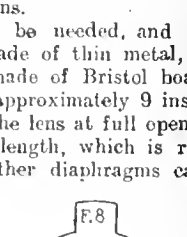


Fig. 3.

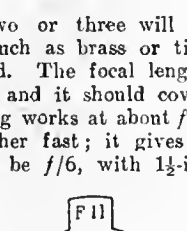


Fig. 4.

opening, $f/8$, with $1\frac{1}{8}$-in. opening, and $f/11$ with slightly more than three-quarters of an inch opening. These are rough measurements, but are accurate enough for practical purposes.

If you are using a lens larger or smaller than the one described, and do not know the focal length, focus sharply on some distant object, and the distance from the lens to the ground-glass will be the focal length. Then divide the focal length by the number of the stop wanted, and the result will be the size of the opening. It is not advisable to use an opening smaller than $f/11$ if soft pictures are wanted. The diaphragms should be painted dull black and marked with their f numbers. Figs. 2, 3 and 4 give the size and shape of the diaphragms. Should you not have a shutter that will fit your lens tube, a lens cap must be made of cardboard and painted dull black inside.

This lens can only be used successfully with a camera which has a focussing screen. It cannot be used on Kodaks, or fixed-focus box cameras, as to get the desired results the image must be focussed on the ground-glass. It must be noted, and this is *very important*, that as the lenses are not corrected for colour, after focussing, and before the exposure is made, the ground-glass *must be moved towards the lens*, about 1/40 of the focal length of the lens, or in this instance from $\frac{1}{8}$ to $\frac{1}{4}$ of an inch. This allowance must be made, as the blue rays fall in focus somewhat nearer the lens than the yellow and red rays. The writer uses this lens on 5 x 4 plates, and finds that this focal length gives very good perspective, and the negatives enlarge very nicely. Also it was found that with this length of lens tube exposures against the light were satisfactory, and especially so when Eastman Portrait Film was used, as this overcame halation.

With all soft-focus lenses experiments should be made with different openings and the results noted. No one can advise just how such lenses should be used, but a few trials will give the worker an idea of what can be done with them, and having certain results in mind these can be worked out.

It is always desirable to give full exposure, and orthochromatic plates and a ray filter will generally give better results than ordinary plates.

Before closing it would be well to say, if you do not secure the desired results first do not blame the lens, as very beautiful pictures can be produced with such a lens when properly handled.

L. M. A. Roy.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications June 6 to 10 :—

Colour Photography.—No. 16,188. Sensitised plates for colour photography. S. Hall.

Automatic Focussing.—No. 15,910. Apparatus for automatically focussing projected images in photographic enlarging and copying J. A. H. T. Rosewarne.

Colour Photography.—No. 16,060. Devices for production of photographs in natural colours. L. Horst Farbenfilm Ges. and L. Horst.

Pumps.—No. 16,034. Liquid pumps (for mixing chemicals). K. C. D. Hickman.

Electrical Transmission of Photographs.—No. 15,935. Apparatus for electrical transmission of photographs, etc. G. R. Judge and R. A. Storey.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

Apparatus for Developing, Fixing, Toning, Washing and Drying Photographic Films.—No. 174,794 (June 8, 1921). This invention relates to apparatus for treating long exposed photographic films, and has particular reference to apparatus of the kind used for treating long kinematograph films, and comprising flanged drums or rollers arranged in parallel pairs in a series of tanks containing the respective chemical solutions for developing, fixing, washing, etc., and means for conveying the film to and

fro between the pairs of drums or rollers, transferring it from those in one tank to those in another, and finally to a drying chamber in which the film also travels around rollers or drums. In such apparatus means such as a dummy strip or a clip on a conveyor band are usually provided to thread the forward end of a film through the apparatus, and means such as a wiping pad or roller of suitable material such as chamois leather are provided to remove adhering liquid from the film at stages in its travel. Also in view of the variations in length of the film some

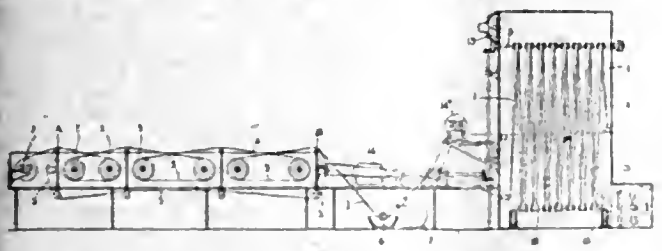


Fig. 1.

loops of the film pass around rollers merely slung or suspended in them, or the rollers are secured to a rotating shaft mounted in resilient bearings.

In one arrangement the lower rollers are mounted on a resilient arm or carrier, with their axes equidistantly spaced and at right angles to the plane of up and down travel of the film between the lower and upper rollers, the axes of the latter also being at right angles to the plane. In another arrangement the upper rollers are co-axially mounted on a shaft lying in the plane of travel of the film and the lower rollers, some of which are resiliently mounted, have their axes at right angles to said plane.

According to the present invention the film, after leaving the developing, fixing and washing tanks and entering the drying chamber, passes over and under upper and lower rollers arranged in two parallel rows, whereof the rollers of the upper row are coaxially secured on a driven shaft extending substantially in the plane of the up and down travel of the film, whilst those of the lower row are mounted coaxially but individually free upon a parallel shaft resiliently mounted to allow for shrinkage of the film. In an alternative construction the lower as well as the upper rollers are secured coaxially to a driven shaft extending substantially in the plane of the up and down travel of the film, but certain loops at intervals instead of passing around a lower roller on the lower shaft pass around idle rollers spaced at intervals between the lower rollers, and each mounted on a spring

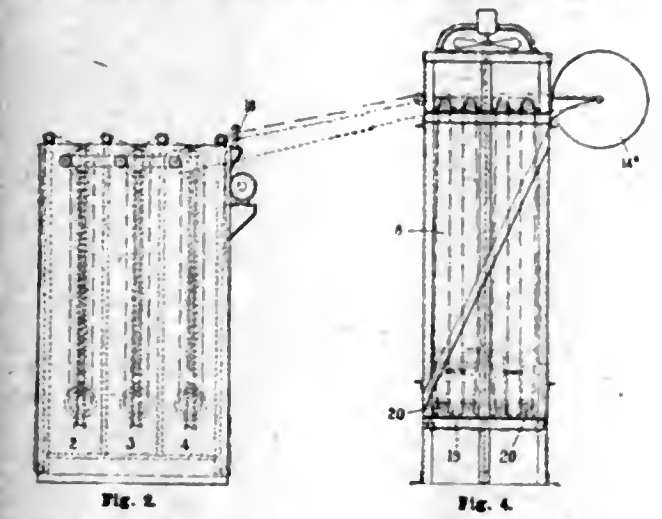


Fig. 2. Fig. 4.

controlled or weighted arm with its axis parallel to the axis of the other rollers.

Fig 1 is a part perspective partly diagrammatic view of one form of the complete plant or apparatus. Figs. 2 and 6 illustrate a modified form of the plant, figs. 2 and 3 being an elevation and plan respectively of the developing, fixing and washing tanks, and figs. 4, 5 and 6 being respectively an end elevation, a plan, and side elevation of the drying chamber.

In fig. 1, the numeral 1 indicates the film to be developed, and 2, 3 and 4 the developing, fixing, and washing tank respectively. In each tank is arranged a pair of parallel horizontal drums which are immersed or partly immersed in the liquid in the tanks. 5 indicates an endless band which passes to and fro between the drums and from one pair to the next and around and over suitable guide rollers outside the tanks. One drum of each pair of drums is driven by a belt from any suitable source of power. 6 represents a bath for alcohol and a roller to guide the film through it. 7 is an air pump to assist in drying the film. 8 is the drying chamber in the upper part of which a row of flanged rollers is fixed to a power driven shaft 9. The film passes over the rollers and hangs between them in long loops. In these loops flanged rollers 10 are mounted freely as shown on a shaft 11 the ends of which are supported on springs to permit the rollers to rise as the film shortens in drying. Pre-heated air enters the chambers by way of the ante-chamber 12 and leaves by way of the fan 13.

In using this form of the apparatus a power source such as the electric motor 14 is started and drives through any convenient form of gearing one drum of each pair of drums in the tanks 2, 3 and 4, also the shaft 9 in the drying chamber, the winding up drum 14^x and such other parts such as guide rollers as may be required. Air heated by the electric radiator 15 is also circulated through the drying chamber 8. The front end of a film to be dried is attached to the endless band 5 at the start point A and is carried and guided by it to and fro between the drums in the developing tank 2 and thence to the fixing tank

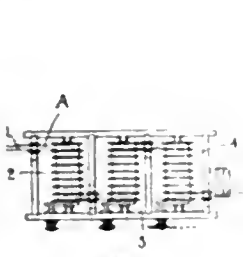


Fig. 3.

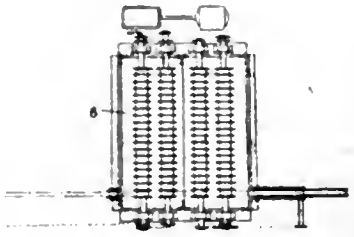


Fig. 5.

3 and similarly to and fro between the drums therein and thence to the washing tank 4, and similarly between the drums therein and over the guide roller 16. The front end of the film is there unclipped from the endless band 5, and is passed under the guide roller in the alcohol bath 6 and thence past the air drying device 7 to the drying chamber. The film is threaded over and under the upper and lower rollers and finally on to the winding up drum 14^x.

Referring to the modified apparatus shown in figs. 2-6, and in particular to the developing, fixing and washing baths 2, 3 and 4 it is to be observed that they are much deeper than those shown in fig. 1, and that the drums of each pair are arranged one above the other instead of side by side. The film passes on to the upper drum at A (fig. 3.) and thence up and down between the drums in the developing bath, thence over a guide roller on to the drums in the fixing bath, then over another guide roller on to the drums in the washing bath, and finally between upper and lower camel hair rotary brushes 18, for removing moisture, to the drying chamber 8. In the chamber 8 the film passes up and down between upper and lower flanged drums in pairs, and finally on to the winding up drum 14^x. The construction in figs. 4 and 6 illustrate a modified arrangement for allowing shrinkage of the film as it dries. The lower flanged drums 19 are arranged in sections on a shaft 20 mounted in a stationary end bearings, and between the drum sections there are freely mounted on the shaft a number of forked arms 21, carrying freely mounted flanged rollers 22 around which the film passes. These arms may be weighted or spring controlled if necessary to provide the requisite tension on the film.

The various rotary parts of the apparatus may be driven by sprocket wheels and chains as represented diagrammatically, but it is to be observed that the film is conveyed throughout its travel without its perforated edge being employed to drag it along, and there is therefore no distortion of the film from that cause

The developing, fixing and washing tanks may be provided with superposed reservoir tanks containing a fresh supply of the necessary liquid, and ball valves or equivalent automatic feeding

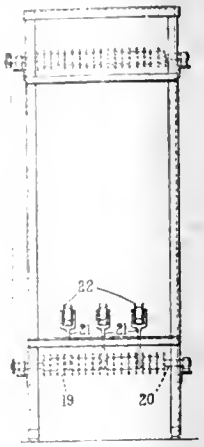


Fig. 6.

devices may be provided to maintain the level of the developing, fixing or washing liquids as the case may be.

In addition to the developing, fixing and washing tanks, a toning tank may if desired be incorporated in the plant.—Paul Louis Barger, 14, Hartington Road, Twickenham, Middlesex.

The following complete specifications are open to public inspection before acceptance:—

Colour Cinematography.—No. 12,408. Optical devices for vision or projection in colours of films with microscopical refractive elements. A. Keller-Dorian.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

Autotype (Design).—No. 423,811. Photographic papers. Walter Montague Rouse, trading as the Autotype Co., 74, New Oxford Street, London, W.C.1, merchant. February 27, 1922.

Educational Pictures (Design).—No. 424,040. Sensitised-films for photography. Educational Films Co., Ltd., 76, Wardour Street, London, W.1, film renters and producers. March 4, 1922.

MARKS PLACED ON THE REGISTER.

Kodak (Designs).—Nos. 420,930-31. Photographic papers. Kodak, Ltd., Kodak House, Kingsway, London, W.C.2, dealers in photographic materials.

New Books.

Photography in Colours.—For some years past the text book, "Photography in Colours," by Dr. Lindsay Johnson, has, on the whole, been the best source of information on the various colour processes which at one time or another have reached the commercial stage, and have been used by photographers. A fourth edition (7s. 6d. net), just issued by Messrs. Routledge, might reasonably have been expected to have represented such progress as has been made since the previous edition of the book was published in 1916. A good deal has been done since then, more especially in colour cinematography, which latter Dr. Johnson includes within the scope of his work. Nevertheless, scarcely any attempt has been made to bring the text up to date. Many of the passages have now a curiously antiquated appearance. For example, twenty-four pages are still devoted to the Utocolor bleach-out paper of the late Dr. J. H. Smith. On page 193 Dr. Johnson states that the paper is "now manufactured" by the Société Utocolor, of Paris, although this company had ceased to exist several years before Dr. Smith's death in 1917. A modern treatise on colour photography need not trouble itself much about the bleach-out process, which probably is as dead as Queen Anne. In like manner, in the chapter on screen-plate processes, the reader must conclude that the long dissolved Thames Colour Plate Co. is at least still in existence, for on page 79 it is stated that emulsion-coated colour-screen plates are "about to be placed on the market by the company." We forget exactly how many years it is since the Thames Plate Co. ceased to exist, but it must be seven or eight at least. The fact is that the author has produced not a revised edition but the previous one, with such touches here and there as could be managed without interfering with the make-up of the pages. The only essentially new additions are eight pages printed at the end as a second appendix. It is a pity that the author should not have revised his work upon a scale corresponding with progress in the subject, but the omission is perhaps less to be regretted, inasmuch as a large and full treatise on colour photography by Mr. E. J. Wall is on the eve of publication.

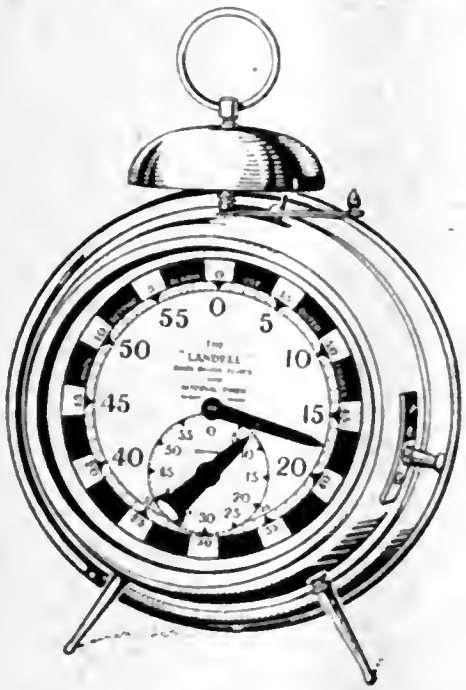
The Cinema Handbook.—It is not easy to imagine that those interested in practical cinematography for purposes other than the eternal drama film will get a better manual of instruction and information than this "Cinema Handbook," just issued by Messrs. Sampson Low, price 14s. net. For the author, Austin C. Lescarboura, took up cinematography as an amateur and ended by making extensive professional use of it. Moreover, he is an editor of the "Scientific American," and thus the work of putting his knowledge into unmistakable and readable English comes naturally to him. His longest chapter is on cinematograph cameras, in describing which he shows an acquaintance with English and French as well as with American models, although the latter get the lion's share of notice. Operation of the camera, developing and printing the negative film and the use of projection lantern occupy similarly highly practical chapters, but perhaps those which are most deserving of recommendation are the ones in which the author deals with the uses of cinematography for industrial and advertising purposes, for the making of films of family, friends or pets, for the production of amateur motion-plays and for many very different educational purposes. Progress in the application of the cinematograph in these directions continues to be slow. The vulgarities of the cinema theatres still dominate the field. Nevertheless, there are signs that schools, colleges, churches, factories, commercial establishments will use cinematography upon a scale at present undreamt of. Mr. Lescarboura does not hesitate to declare his belief that ultimately these uses will overshadow the theatrical stuff, and his manual is written for those who wish to make themselves proficient—for the teacher, traveller, engineer and, we would add, the professional photographer. The latter, technically and commercially, has the advantage over most other classes in ability to make use of these opportunities when they arise, and he should at least not omit to qualify himself by drawing on the stores of knowledge in this book. The many illustrations and diagrams add to the value of the work, which, moreover, is written in a bright, clear style that makes reading a pleasure.

Photographic Chemicals.—Following the brief mention in our issue of June 2 of a French manual on photographic chemicals, the publishers, MM. Charles Mendel, 118, Rue d'Assas, Paris, kindly send us a copy. It is "Les Produits Chimiques Purs en Photographie," and the author is Dr. Camille Poulenc, who, we presume, is a member of the renowned chemical firm of this name. The volume, in the course of 150 pages, gives practical information on the chemical substances used in photography, that is to say, brief particulars of their properties as regards solubility in various solvents, stability, tests, impurities, and, in some cases, methods of estimating purity. For those who read French no more useful volume for information regarding "photographic chemicals" can be desired. In France the price is 5 francs, subject to a surcharge of 100 per cent. in the case of copies exported to England.

Paget and Rajar Competitions.—Two series of competitions for amateur photographers have just been started by Messrs. Amalgamated Photographic Manufacturers, Ltd. One is for prints on Paget self-toning paper from any negative, film or plate, of any subject taken in any camera. The other is for prints on any paper from negatives on Rajar roll film. In each competition prizes, ranging from £5 5s. to £1 1s., will be awarded each month, together with consolation prizes. Entries should arrive at Department 8, A.P.M., Ltd., 3, Soho Square, London, W.1, on or before the last day of each month.

New Apparatus.

THE LANDELL DARK ROOM CLOCK.—An improved model of this clock, which we reviewed in our issue of October 21 last, has been introduced by Messrs. Lingwood & Lowen, 10, Chadwell Street, London, E.C.1. The improvement consists in dispensing with the separate small dial for the alarm. The latter is now set by means of the minute hand on the large and more easily read dial, an outer



reversed numbering of this dial being provided, as shown in the drawing. The large dial thus serves for setting the alarm to ring at the expiration of any period from ¼ minute to one hour. It also marks off minutes, whilst the smaller dial records seconds. The new model, like the former one, is evidently very well made, and is sold at the same price, viz., 25s.

ROENTGEN SOCIETY.—The following officers and members of Council have been elected for the session 1922-1923:—President, Sir Humphrey Rolleston, K.C.B. Vice Presidents, Prof. Sir Wm. H. Bragg, K.B.E., F.R.S.; Prof. Sir Ernest Rutherford, F.R.S.; A. E. Barclay, M.A., M.D. Hon Treasurer, Geoffrey Pearce, 33, Newton Street, London, W.C.2. Hon. Secretaries, E. A. Owen, M.A., D.Sc.; Russell J. Reynolds, M.B., B.S. Hon. Editor, G. W. C. Kaye, O.B.E., M.A., D.Sc. Council, Cuthbert Andrews, G. B. Batten, M.D., A. E. Dean, Kenelm Edgcumbe, N. S. Finzi, M.B., F. L. Hopwood, D.Sc., F. Hernaman Johnson, M.D., C. E. S. Phillips, O.B.E., Prof. A. W. Porter, D.Sc., F.R.S., Prof. A. O. Rankine, O.B.E., D.Sc., Sir Archibald D. Reid, K.B.E., C.M.G., R. W. A. Salmond, O.B.E., M.D.

HOUGHTONS' PROFESSIONAL CATALOGUE.—A new edition of their catalogue of professional requisites has just been issued by Messrs. Houghtons, Ltd., 88-89, High Holborn, London, W.C.1. Its contents embrace the materials and appliances for portrait studios from cameras for indoor and outdoor work to such items of stationery as transparent envelopes and postal wrappers. Lenses, studio shutters, enlargers, backgrounds, screens and reflectors, studio furniture and accessories, and a great variety of mounts figure in these well-illustrated pages. Among the items of equipment notable from the mechanical standpoint are the very efficient rotary bevelling machine, the Houghton rotary print drying machine, and several patterns of printing boxes. The prices exhibit considerable reductions in many cases. Every professional photographer will want to have one of these catalogues at hand, and can obtain one on sending his trade card to Messrs. Houghtons.

Meetings of Societies.

SUNDAY, JUNE 25.
Willesden Phot. Soc. Outing to Chesham.

MONDAY, JUNE 26.
Southampton C.C. Print Competition. Portraits and Figure Studies.

TUESDAY, JUNE 27.
Bournemouth Camera Club. "Oil Finishing Bromide Enlargements." H. T. Davey.
Hackney P.S. "Personality in Pictorial Photography." E. Brooks.
Manchester A.P.S. R.P.S. Affiliation Competition Prints.

WEDNESDAY, JUNE 28.
Bournemouth Camera Club. Outing—No Man's Land.
Rochdale A.P.S. "Colour Photography." H. Dawson

THURSDAY, JUNE 29.
Hammersmith Hampshire House Phot. Soc. "Carbon Enlarging." M. Watson.
Sheffield Phot. Soc. Outing to Wadsley Common.

SATURDAY, JULY 1.
Edge Hill Camera Club. Outing—Liverpool Docks
Edinburgh Phot. Soc. Outing to Hopeton House.
Exeter Camera Club. Outing—Stoke Canon to Thorverton.
South Glasgow Camera Club. Outing to Cathkin Braes.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, June 20, the President, Mr. W. L. F. Wastell, in the chair.

Mr. Edward Peake, formerly of Norwich and now of Cambridge, delivered a lecture on "The Norwich School of Painters," in which he dealt especially with the art of Crome and Cotman, and dwelt at some length upon the real effect it had had upon pictorial photographers in East Anglia, calling into existence a "school" which likewise delighted in the interpretation of open landscape.

On the proposition of Mr. W. B. Ferguson, seconded by Mr. Dudley Johnston, a very hearty vote of thanks was accorded to Mr. Peake for a most eloquent address.

CROYDON CAMERA CLUB.

Mr. A. E. Isaac, an original and popular member, was inveigled by a secretary without appreciable conscience to expound on the "Slide Rule." The attendance might have been better, doubtless due to a sudden change in the weather.

Quite interesting was a preliminary sketch of the gradual evolution of this essentially British instrument. Next came on the scene a gigantic home made model, and the lecturer, with back to his audience, talked learnedly to himself for a considerable time. The conversation included an explanation how the figuring had been set out, mostly lost to the members, who could not see a number.

Gradually an atmosphere of levity permeated the proceedings, and the fun, if not wit, became fast and furious when Mr. Isaac nearly smashed a window by pushing the slide out to its fullest extent. Simultaneously a cube root got adrift, ultimately extracted with some difficulty, apparently, from the floor.

At intervals Mr. Scott astounded everybody by readily furnishing complex ratios, till it was discovered he was possessed of Wrapson and Gee's "book of the words." Personally, he regarded the lower notes of a slide-rule as fairly safe, but the higher were undoubtedly squeaky. Valiant defenders of this curious musical instrument were next found in Messrs. Purkis and Jobling. On the other hand, Mr. Harpur said not for nuts would he allocate his annual balance sheet to the sliding fraternity.

The president, Mr. J. Keane, refreshed by a prolonged nap, conveyed in eloquent terms the thanks of all for a most entertaining evening to Mr. Isaac, who by this time had fully appreciated the humour of the situation. If memory rightly serves, he gave the lecture on a previous occasion at the club, and it is essentially one that will bear further repetition—elsewhere.

During the interval Mr. Ackroyd showed an ingenious camp armchair. Two looped cords are passed over the feet, the other ends terminating in a fabric band as a rest for the back (at the expense of the feet). It gives to the occupant a striking

resemblance to a trussed fowl, and although alleged to be very comfortable, evidently does not afford luxurious ease out of harmony with the simple life.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A meeting of Council was held at 35, Russell Square, on Friday, June 9. Present: Messrs. Marcus Adams, A. Basil, A. H. Ll. Chapman, T. Chidley, A. Corbett, C. F. Dickenson, W. E. Gray, R. Haines, G. Hana, W. Illingworth, H. Lambert, R. N. Speaight, F. Wakefield, A. Swan Watson (President), W. Wedlake, with Alfred Ellis (Secretary) and J. Griffiths (Editor). Mr. A. Corbett took the chair.

Arising out of the minutes, the Secretary reported upon a transaction between a member and a frame maker, the latter having threatened proceedings. After seeing the frame maker and the record of the transaction, he (the Secretary) advised that the photographer's best course, in view of the expense of coming to London to defend the case, was to pay the sum demanded. This action was endorsed.

With regard to a member's complaint that the reproduction of a photograph in a certain paper had not been paid for, the Secretary said that the firm complained of was surprised that any charge should be made for a reproduction in a paper that was given away to their customers, but he persuaded the complainant to hand over the matter to the Association's solicitor, with the result that a demand was made for the fee and costs, and this was promptly paid.

With regard to some plates, of which a member had complained as being useless, Mr. Basil reported that he had tested an unopened packet, and he thought that all that was wrong was probably that they had been in stock for a long time. They showed only a little fogging. The Secretary said that he had advised the member to try them again under different conditions.

The Secretary reported that another member had complained that he gave an order for enlargements which were not supplied, and, as a result of correspondence, the member had had his money returned to him. He had promptly paid up his subscription for a year in advance.

There was a brief discussion in regard to a case in which a member had supplied photographs with a background of which the customer complained. Behind a young girl on horseback appeared a board pointing to a saloon bar. The photographer blocked this out, but after some time the customer refused to pay. The solicitor was consulted, and thought that in an action the photographer would stand little chance, so the member had been advised to let the matter drop. The Council examined the photographs, and endorsed the action taken.

Correspondence was read regarding a complaint by a member that a water-coloured photograph, 30 × 20 in., properly protected, was damaged in transit on the railway, arriving in a damp condition, and spoiled beyond repair. The railway company declined to admit the claim. The Association's solicitor had pointed out that the parcel was sent at owner's risk, which meant that the carrier was not liable unless some wilful misconduct of a servant of the company could be proved. The Secretary said that he had written to the member pointing this out. The moral appeared to be that the sender should declare and insure all valuable goods when sending by carrier. Probably a package of wet fish or ice was placed on this parcel in the luggage van. There was no reason why the member should not ask for compensation as an act of grace. The Secretary's action was endorsed.

Mr. Hana submitted to the members a schedule of prices for commercial work which he had drawn up after exhaustive inquiry. Mr. Illingworth also gave some information, and it appeared that the charges he showed were almost identical with those submitted by Mr. Hana. The latter was thanked for the trouble he had taken, and was asked to supply copies of the schedule to members of Council, so that suggestions might be made and an average decided upon as soon as possible.

Mr. Wakefield reported that the necessary preliminaries with regard to the Congress had now been arranged with the L.C.C. authorities regarding the precautions against fire. In reply to questions, he said it was proposed to charge exhibitors about 5s. per square foot of space. It was found impossible to allow exhibitors to erect their own stands, as the hall was not suitable for that purpose. Mr. Speaight proposed that an emergency meeting of the Council be held as soon as possible, in order to proceed quickly with this matter, and this was agreed to.

Mr. Adams reported that he had received a letter from Mr. J. C. Abel, of the P.A. of America, expressing thanks for the splendid collection of pictures sent to America, which was now on its way to Seattle, Washington, for exhibition there. The Council heard with much satisfaction that Mr. Pirie Macdonald would come over as official delegate to the Congress, and that Mr. Abel hoped to accompany him, and to send a good collection of American work for exhibition. Mr. Adams also said that he anticipated good contributions from California, as well as from European countries. Mr. Speaight added that, from inquiries he had made in Belginm, he believed there would be a good collection from that country.

Mr. Swan Watson and Mr. Haines also reported that they had received fraternal letters from Mr. Abel, who expressed gratitude for the friendly spirit shown by the Association.

Reporting with regard to the programme for the Congress, Mr. Haines suggested that a programme committee should be appointed, to consist of the Secretary of each existing committee. This was agreed to, and it was left to Mr. Haines to convene a meeting.

The President and the Secretary reported upon their visit to the Master Photographers' Association of Lancashire, describing the hearty welcome given to them, and the general interest of the occasion. Mr. Marcus Adams was thanked for sending to this Convention a collection of pictures for exhibition.

The Secretary reported that the same member who had just received payment in a case taken up by the Association had now complained of trouble with a printer of postcards. The postcards having been examined, it was agreed that they would not enhance the member's reputation. The matter was left in the hands of the Secretary.

The Secretary reported that there had been two resignations. Two applications for membership were received, and found to be in order.

After the business of the meeting, which lasted over four hours, was concluded, the President said that, as a member of the Council, he must express his great admiration and appreciation of the enormous amount of time and trouble taken by the London members of the Council in carrying on the work of the Association, and he should like to have that appreciation recorded; whatever the country members of the Council might have to expend in time and money by attending the monthly meetings, it could in no way be compared with the work that was being done day by day by the other members of the Council.

Commercial & Legal Intelligence.

NEW COMPANIES.

British Studios, Ltd.—This private company was registered on June 10, with a capital of £200 in 1,000 ordinary shares of 1s. each and 150 preference shares of £1 each. Objects: To carry on the business of photographers, photographic dealers, artists, picture framers, etc. The permanent directors are:—C. H. Sheffield, The Cottage, Langston, Havant; Mrs. M. Sheffield, The Cottage, Langston, Havant (both directors of Stanley Gordon, Ltd.), with £750 and £500 per annum as remuneration. Registered office: 18, Russell Street, Southsea, Hants.

W. M. Bell & Co., Ltd.—This private company was registered on June 13, with a capital of £2,000 in £1 shares. Objects: To acquire the business carried on by L. S. Woolf, trading as "W. M. Bell & Co.," at 2, Malvern Road, Kilburn, and to carry on the business of opticians, dealers in photographic materials, optical instruments, etc. The first directors are:—J. C. McCorqnodale, 63, Glenmore Road, N.W.3 (managing director); T. H. James, 179, Lynton Road, Bermondsey, S.E. Qualification: Five shares. Remuneration of managing director, £312 per annum. Registered office: 2, Malvern Road, Kilburn, N.W.

Film Printers (1921).—Particulars of the Film Printers (1921), Ltd., were filed on June 6. The capital is £15,000 in £1 shares (11,000 12½ per cent. participating preference, and 4,000 ordinary). The company was incorporated in Isle of Man on November 17, 1921, to carry on the business of printers of cinematograph films in either black or coloured monochrome, or in tints, natural colours or any other process, photographers, etc. The British address is The Hyde, Hendon, where E. B. Smith and R. W.

Wicks are authorised to accept service of process and notices. The directors are: L. J. Hibbert, 51, Whitworth Road, South Norwood; S. E. and E. B. Smith, 16, Fitzroy St., W.1. The Somerset House file number is 2.107F.

News and Notes.

ILFORD LECTURES.—Messrs. Ilford, Ltd., have a few vacant dates for lectures and demonstrations during the next session. A list of subjects will be forwarded to society secretaries on application.

PRIZES FOR MOUNT DESIGNS.—Messrs. Houghtons are offering prizes of £10, £5, and £3, as well as consolation prizes of £1, for designs in portrait mounts, with or without covers. The competition closes on August 31 next.

MICROSCOPES AND PHOTO-MICRO CAMERAS.—The City Sale and Exchange, 81, Aldersgate Street, London, E.C.1, send us a revised catalogue of the renowned manufactures of the Italian firm of Koristka. The list includes several patterns of photo-micrographic camera. The prices show many substantial reductions.

OF INTEREST TO PROFESSIONALS.—Messrs. Kodak, Ltd., have just issued a booklet descriptive of a few of their special lines for professional photographers. Among them are the "Cirkut" panoramic camera, Kodak projection printer, focussing spotlight and "Kodura" and other papers. Obtainable free on application to Kodak House, Kingsway, London, W.C.2.

NEW PHOTOGRAPHS OF MARS.—This week the planet Mars will be nearer the earth than at any time since 1909, at which time Professor Lowell succeeded in obtaining the best photographs of it. Photograhy has advanced during the past thirteen years (writes a Greenwich correspondent), and this week a large party of American astronomers and photographers is going to South America (from which part of the world Mars is seen at its best) for the purpose of getting some improved and up-to-date photographs of the planet and its "canals," and the most wonderful results are anticipated. In our own part of the world, Mars, though a splendid naked-eye object, is rather too low in the sky to permit of detailed telescopic observation or really good photographs of it.

DIRT ON LONDON'S STUDIO ROOFS.—Photographers located in the provioces may learn, from a report of the Medical Officer of Health for last year, of some of the inconveniences their brethren in London met with, and cease to wonder why so many of them go in for artificial light installations. In November last the amount of deposit registered as falling in the City amounted to 18.37 tons per square kilometre, which is equal (estimating the City as having an area of one square mile) to no less than about 47 tons. Of this mass of dirt, approximately 27½ tons were soluble, and 19½ tons were insoluble, and consisted of tar, carbon and grit. During the year the amount of the impurity at noon varied from half a milligramme to six milligrammes per cubic metre of air. This latter figure included times when there was a fog.

PHOTOGRAPHS OF CRICKETING.—The many excellent photographs of cricketers appearing in the Press to-day are a credit to photography, and special mention might be made (writes a correspondent) of the cricketing pictures illustrating the advertisements of Ross, Ltd., and Taylor, Taylor & Hobson, Ltd., in last week's "B.J." Photographers have yet much to learn concerning the picturing of lawn tennis players and footballers, who are usually depicted in the most ridiculous attitudes imaginable. One of the secrets of success is distance, the T.T. & H. advertisement telling us that the operator used a telephoto lens at a distance of 200 yards. Players at football and tennis are usually taken "close up," and from peculiar points of view, and photographers of all sports would no doubt do better if they employed a long focus lens and stood at a greater distance from their subjects.

PHOTOGRAPHING MANSIONS.—A writer in one of the daily papers last week referred to poorness of many aristocratic families living in Elizabethan and other mansions, and gave as a proof of it their attitude towards photographers. Years ago, it was stated, the nobility often refused permission to photograph their pictorial residences and grounds, but to-day photographic firms were actually approached by owners of mansions only too anxious to offer facilities for either film or still work at a reasonable figure. "Only this week," says the report, "an estate in Gloucestershire of 6,000 acres has been on offer. The daughter of the house, making a personal round of visits to photographic firms, has explained that she offers an Elizabethan mansion with an imposing exterior, a 200-year-old pigeon-cot, with accommodation for 500 pigeons, four or five picturesque summer houses, wooded nooks, a lake and a stream, and even two collie dogs."

PORTRAITS IN PHOTOGRAVURE.—We have recently inspected with a good deal of pleasure examples of the work of the Photogravure Company, 21, Farringdon Avenue, London, E.C., a firm owned by Mr. J. W. Beaufort, of Elliott & Fry. For some time past in his own large and important business, Mr. Beaufort has found a growing demand for portraits in photogravure for presentation purposes in numbers, and hence has been moved to assure to himself the means of their production. A photogravure has a character of its own, and when prints are issued of such beautiful quality as those we have seen, photographers generally will be glad to take advantage of the resources of the Photogravure Company. In cabinet size the charge for proofs to the number of a hundred or less works out at little more than sixpence apiece, so that there is the opportunity for the photographer to offer an important customer something wholly distinctive and to reserve a nice profit on the transaction to himself. The company does not intend to cater for the postcard publisher: its specialty is larger work in comparatively small editions. Among the specimens were some exquisite examples of photogravure in colours by hand inking of the plates, a branch of work which the company has wrested from the Continent, and in which it has satisfied the critical taste of publishers of the exquisite French coloured mezzotints. Perhaps no higher testimony could be paid to its craftsmanship.

Correspondence.

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

*** *No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

CHARGES FOR ELECTRICAL ENERGY USED IN PHOTOGRAPHIC STUDIOS.

To the Editors.

Gentlemen,—With regard to the recent case in the King's Bench, fully described in your issue of May 26 last, I have carefully read the subsequent issues and failed to find any further reference thereto.

Perhaps, as the matter is (apparently without their knowing it) of considerable interest and importance to a great and increasing number of photographers, you will allow me, an outsider so to speak, to make good the omission, whether this arises, as it would seem, from the apathy of your readers—a category which, I am reliably informed, includes the whole of the photographic profession—or not.

And, firstly, no praise is too high for the editorial summing-up. It covers the ground so ably and fully, yet withal so succinctly, that it might be the work of both lawyer and electrical expert—and both tempered more than ordinarily with the common-sense of everyday business—that I can do little more than emphasise the importance of the subject to all users of electrical energy, no matter to which industry or profession they may belong, and clothe it in special garb as it appears to one who has had some seventeen years' experience of electrical power generating and supply station work.

I cannot claim any knowledge of the business side of professional photography. Perhaps, sirs, you can tell me whether "art" carries members of that profession above the sphere of such mundane considerations as appertain to business?

Perchance you can induce your contributor, Mr. Pelham Swinton,

to enlighten me, or is it only the "dons" that can afford to photograph debutantes with "five 15,000 candle-power lamps . . . . flowing ties and tortoise-shell spectacles," as described in the evening papers, without counting the cost?

The question has often been put to me: "When did the electrical supply companies first differentiate between 'light' and 'power'?"

This is difficult to answer definitely, as the difference arose by a process of evolution. The St. Pancras Borough Council were certainly one of the first (some thirty years ago) to recognise the necessity for fostering and encouraging daylight use of electrical energy, to enable them to run their generating plant for longer continuous periods per day, thus reducing the cost per unit generated, the interest charges on capital outlay of plant being considerable, lower priced units and other methods of inducement having to be resorted to from the first in order to oust the firmly established gas competitor from the field.

One fundamental difference between the competing gas and electrical undertakings consists in the greater ease and comparative cheapness with which gas can be accumulated in gasometers during what is practically a level rate of production spread over many hours' continuous generation, the main-peak load demand of customers being supplied mainly from this reserve, which means a considerable saving in initial outlay on generating plant such as is occasioned with electricity, and what might be termed a rental charge that has to be covered in the total amount charged to customers in proportion to their rate of use—diversity of time factor.

The law has never been so favourably inclined towards electricity, handicapping it to a great extent in its competition with gas undertakings. Hence, from time to time, we hear of such actions the Long Eaton, Hackney, Ilford, and others as mentioned by the learned Judge.

Now, there are some aspects of the judgment which appear somewhat strange, maybe owing to my not possessing a legal mind.

The learned Judge having stated (*a*) That the station turns out only one kind of energy, (*b*) that the purpose to which the customer puts this energy is irrelevant, and, (*c*) that it is only in so far as the customer's circumstances react upon the supply that he takes—in the matter of load factor, diversity (time in use) and quantity of units purchased—that differences of charge are allowed; the learned Judge then proceeds to assume, without evidence either for or against, that the particular load in question is different from or inferior to the loads of other users who are regularly charged the ordinary advertised "power" rates. This is "palpably out of relation with the facts." I respectfully submit that many users of electrical energy use as high, or even higher, amperage, and use it more intermittently, purchase a smaller number of units, and possess no meritorious features from the point of view of the electrical power generating station (lifts, hoists, vacuum cleaners, sawmills, to mention a few). Yet these are charged ordinary advertised low "power" rate.

I can recollect from my own experience a sawmill which used electrical energy at a rate of some hundred odd amperes, which were intermittently imposed on the generating plant with "rimbrake" jerks; in fact, it was only by considerably strengthening the main fuses that we could maintain the supply to the consumer to enable him to convert into planks the "fallen majesties of the forest" with one fell swoop of many saw blades and many thrusts into their vitals.

The intermittent load under question fades into insignificance against this example, which was at 1d. per unit, if I remember correctly.

Again, the learned Judge says: "Photographers, speaking generally, are not taking current for power purposes under similar circumstances to other manufacturers."

As a fact, the electrical energy demanded and so used by different photographers varies so greatly that it seems impossible to treat them "generally." Speaking specifically, the defendants are using electrical energy under circumstances similar (and more advantageous to the electrical power generating station) to some other users in the immediate vicinity.

Regarding his Lordship's final sentence, which seems irrelevant, "All photographers in the area using this supply have been treated in the same way"—they may have, but have all those photographers treated the electrical power station in the same way—*i.e.*, in the manner in which "they react upon the supply"? One cannot compare the load of those photographers who only use electrical energy when the photographic values of daylight fail, *i.e.*, during the period of maximum or peak load on the generating plant, and those who, like the defendants, use the current all day and every day. On the occasions I visited the studio the energy was in use practically continuously, being shut off at intervals to economise, in view of the threatened 8d. per unit charge, moreover in a basement shut off from daylight.

I might here remark upon a great diversity of opinion among London electrical supply generating station authorities, several of whom seem to be very undecided about what should be charged for electrical energy to photographers, viz. :—

15 areas charge "power" rate.
1 area charges full "lighting" rate.
14 areas not definite; subject to negotiation, probably compromise.

In the defendants' case we have :—

Years 1913-1916—1d. per unit = power rate.
Years 1916-1921—1½d. per unit = power rate (war increase).
May, 1921-October, 1921—8d. per unit = lighting rate.
October, 1921, to date—4d. per unit = query rate.

I wonder how a gas undertaking would fare if it charged initially 2s. per 1,000 cubic feet in 1913, or for comparison in tabular form :—

1913-1916—2s. per 1,000 cub. ft.
1916-1921—3s. per 1,000 cub. ft.
1921, May—16s. per 1,000 cub. ft.
1921, October—under protest, 8s. per 1,000 cub. ft.

Would it help to popularise the use of gas in the present state of business? Putting it bluntly, is the plaintiffs' supply seriously affected by the defendants' method of using the energy, there being so many intermittent users of electrical energy, whose demands would not occur simultaneously?

I am informed that in the provinces a very large majority of the electric supply undertakings charge power rates for photographic users without so much as a quibble.

It is practically impossible to interpret the clause "Under similar circumstances." To be fair to defendants, it seems that all intermittent users of electrical energy should be charged at the same rate, whatever use the energy is put to. If not, the clause "Undue preference" exercises one's mind. Or, in future, are electrical supply charges to be based upon the class of industry or profession? A greengrocer will not make varying charges according to the individual business or profession of his several customers, e.g., by charging 3d. a lb. for apples if for eating *uncooked* as against 2d. a lb. for eating *cooked*; or, again, if a customer eats one apple per hour for eight hours and the other eats the eight in two hours, say. Pardon my putting forth this analogy, under the plea of my endeavour to make the question of electrical supply clear to non-technical minds. Although I run the risk of being dubbed a "heretic" by the electrical generating and supply undertakings, my desires are quite the opposite. I want to see electricity used more extensively, and every effort made to popularise its use.—Yours faithfully,

J. C. Elvy, A.M.I.E.E., M.I.E.S.
Consulting Electrical Engineer.

12, Tavistock St., Covent Garden, London, W.C.
June 19.

SYSTEM IN HALF-TONE OPERATING.

To the Editors.

Gentlemen,—I was very pleased to see Mr. Ralph Grenell's letter in your issue of the 9th inst., and to read his exposition of the Douthitt System. His letter confirms my original opinion that the system is unnecessarily complicated, and does not agree with my formula for a successful half-tone operating system.

The optical and physical laws upon which it is claimed that the Douthitt system is based are unalterable, but to what extent do they apply to the questions at issue? The optical law applies to the distance of light from copy and to the ratio of camera extension to stop opening, but I fail to see how the physical law applies. Mr. Grenell tells us that the openings in a 100-line screen transmit four times more light than the openings in a 200-line screen. The screen opening cannot transmit more light than it receives from the lens, and, assuming the same stop diameter in each case, the larger screen opening distributes the light over a larger area and forms a larger dot than the finer ruling, but the light transmitted over a given area of the photographic plate is the same in either case, providing that the screen separations are accurately adjusted.

The Douthitt screen separations may be optically correct from the stops used, but I cannot agree to the necessity for smaller stops for

coarser rulings, and the consequently greater screen separation. That the system obtains good tonal gradation with different screen rulings is no proof that it is the only system that will do so; it only proves how much latitude there is in the process. I believe that it is possible to obtain equal gradation from a given copy with a variety of stops with the same screen providing the separation is accurately adjusted to each change of stop, and the same thing applies to different rulings. But why use such a variety of stops when as good gradation can be obtained by much simpler means? that is, with the same stop, exposure and light-distance with all screen rulings from a given copy.

The attempt to make exposure constant with different rulings by varying the light-distance is only another complication. What happens in the case of a coarse screen negative from a large copy outside the radius of the lamps at the close position? It is as well to remember that all half-tone operating is not done with movable arc lamps. In my own case, for example, the whole of the work is done with mercury-vapour lamps that are never moved except in the case of an exceptionally large copy.

My statement as to correct gradation being only possible with one stop is not affected by any dodge that may be resorted to to secure a negative from the unusual copy, because in this case we are deliberately seeking false gradation. I have yet to find any advantage in using more than one stop, even for the unusual copy, but it does not follow that the stop used has the same proportion to the extension as the screen opening has to the separation.

I am glad to see that Mr. Grenell finds that the same laws apply to wet as to dry plate, because I have always assumed that they did, but have not felt sufficient interest to test it out.

My promised article on the diffraction fringes has been held up owing to pressure of other work, but it is well on the way, and I expect to complete it during the next few days, when I hope that it will help to solve some of these problems.

Since writing the above, Mr. Ray's letter has come to hand, and I must express my pleasure to find that the subject is attracting attention. This letter is already much too long, so I will endeavour to reply to Mr. Ray next week.—Yours faithfully,

E. A. Berman, F.R.P.S.

BLUE SCREENS IN COPYING STAINED PRINTS.

To the Editors.

Gentlemen,—I can sympathise with Mr. Milner in his perplexity. I noted this variance with theory fifteen years ago, but may I suggest that he tempers his theory with a little practical experience of the subject in question. It may interest him to know that the ink stain was black, not blue-black, and the use of the phrase, "*somewhat* expected," was due to past experience.

Possibly Mr. Milner did not read my letter carefully, or he would not have jumped to the conclusion that the experimenting in the making of colour screens was an initial attempt at photography. Also he should have been impressed by the particular mention of the choice of screen and the nature of the stain. Neither did I intend the inclusion of "a yellow-freckled cloud" under the heading of "copying."—Yours faithfully,

Brentwood, June 19. C. D. Venning.

SULPHIDE TONING.

To the Editors.

Gentlemen,—Your editorial article on the sulphide toning of bromide prints indicates very plainly that there are still many photographers who do not realise the conditions that are essential for obtaining uniformly successful results. The simple process of toning by first bleaching a print and then treating it in a solution of sulphide should leave nothing to be desired, and, in addition, it should be so certain that failure, or even partial failure, should be impossible.

The subject of sulphide toning is, naturally, too long to discuss fully in a letter, though it would be interesting to write on the conditions necessary for ensuring success. But as I have given considerable attention and devoted a large amount of experimental work to this process, I would like to supplement your remarks by adding a note on a distinctive difference between the single-solution processes and the bleaching and sulphiding method.

The principal difference is the colour of the resulting image. In the single-solution methods the colour is a purple-brown. In your article you describe it as "the standard brown of the carbon printer," this standard brown being essentially a purple brown. Bleaching followed by a sulphide solution produces a pure brown, without any trace of purple, whether the brown be relatively cold or warm. And this purity of colour possesses another advantage, there is a greater transparency of the shadows.

In the modification which I introduced some years ago, by means of which brown-blacks or cold browns were obtained by adding a mercuric salt to the bleaching bath, this purity of colour was still maintained; the colour was always brown or brown-black, and never a purple-brown or purple-black.

Considering the simplicity of sulphide toning, and the richness and quality of its results, it is surprising that any photographer can be found who will admit that it presents difficulties.—Yours faithfully,

Henry W. Bennett.

Ilford, June 17, 1922.

To the Editors.

Gentlemen,—Permit a very humble worker—but nevertheless a practical one—to endorse all you say in your last week's leading article on sulphide toning, and to suggest that the subject be further investigated.

Post-war bromide and gaslight papers do not tone nearly so well by the sulphide (bleaching and darkening) method as did the pre-war papers, and the liver of sulphur, or even the hypo-alum process seems to suit modern papers better than the two-solution sulphide process. In pre-war days I found no difficulty whatever in securing the most pleasing of rich, deep brown tones, but I fail to do so to-day even when I use the same make of paper and formulæ, or, as it would be more correct to say, what are believed to be the same. Some chemicals have, in my opinion, changed somewhat, and many old formulæ require to be overhauled.

We have also different emulsions to deal with, and the present craze for emulsions giving images other than the purest of blacks by direct development, has resulted in emulsions giving images which do not tone so well as one would wish. Obviously the makers pay the greatest attention to the production of a warm-black or brown-black tone by direct development, the toning of the image being quite a secondary consideration.

All makers, I suppose, claim that their bromide or gaslight emulsions will tone well in a sulphide bath, but no maker has to my knowledge produced a paper giving an image specially suitable for toning. And yet there should be a market for such a paper, as sepia-toned bromides continue to be a leading line with many of us, although at present it is rather a "hit-or-miss" method of working.

It is not the directly-developed tone that interests many, but rather the tone obtained in a toning bath, and I for one care not how black, or what shade of black, the developed image is if it will tone well. And as sepia-toned bromides are now a regular line I wonder paper-makers do not help us by giving the matter some extra special attention.—Yous truly,

Ellis D. Owen.

WEDDING PHOTOGRAPHS.

To the Editors.

Gentlemen,—To-day's "Daily Chronicle" suggests that "the ordinary wedding photograph is on the way to becoming a thing of the past." This may be so, but the method I adopted a few days ago may prove of interest.

Receiving an order to photograph a wedding-party I, in addition, took photographs of guests entering the church; the bridesmaids in the church porch; arrival of the bride and her father; a photograph inside the church during the ceremony; and the bride and bridegroom leaving after the ceremony.

The wedding party, and the bride and bridegroom, were photographed afterwards as arranged.

The proofs were mounted in a loose leaf album, together with a photograph of the church, the whole forming an interesting—and I hope an irresistible—souvenir of the occasion.

Such a collection should prove more acceptable to those concerned, and what is so important now-a-days, should bring in a more profitable order.—Yours faithfully,

F. Jenkins.

High Street, Southwold, June 17.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

F. B.—We cannot suggest a better arrangement than that which you sketch. The only thing we should alter is to change the lamps over to the other side of the studio. In nine cases out of ten the left side of the face is better-looking than the right. Your work is quite good, but we should imagine that you are using rather a short focus lens for such large heads. To get good drawing you want at least a 12 inch lens for this size.

E. F.—For whole-plate large heads the best results are obtained with a lens of focal length between 20 and 30 ins., or even longer. There is plenty of room in a 23 ft. studio for the use of a lens of this focus for this special purpose of large heads, but it will be of comparatively little use for anything else. If you want to make, say, cabinet heads in the studio, with the same lens, about 14 to 16 ins. focal length is as long as you can afford to have.

W. A.—Your inquiry is so vague that it is impossible to deal with it within the limits of a letter. Finishing may be done in monochrome with water-colour, oil-colour, crayon or acrograph, and it would require a fair-sized book to describe them all. You can obtain a special catalogue of photographic finishing materials from Winsor and Newton, 37-40, Rathbone Place, London, W.1. When you decide on which process you will adopt we shall be glad to answer any specific questions.

E. D.—So far as we know there is no "paste" which can be used to repair camera bellows. The best way to do this is to extend the bellows as fully as possible, and to cement with Seccotine or similar glue small pieces of silk or shiny black linen inside the corners. A little Seccotine may be rubbed over the ragged places outside, and the surface patted smooth while the glue is damp. If the leather is badly damaged, a bit of thin basil leather may be stuck on where necessary.

K. G.—It is entirely contrary to the custom of the trade that an enlarging firm should put its own name on the enlargements which it makes for its professional photographer customers. You should certainly return the enlargement, pointing out that it is useless to you when mounted with the name of anybody else upon it. There is no particular objection to the word "copyright," but on the other hand you should be the person to decide whether you wish this inscription to appear or not.

P. S.—We think the explanation of the films is that there is a damage in the bellows which is fogging the greater portion of the image by diffused light, whilst the various black lines represent pin-hole images of the sun moved about on the surface of the film. It is quite a common experience that only some negatives out of a spool are fogged in such a case, as it depends upon how long the camera is carried with the bellows extended, and also the volume of light and the position of the sun have an influence.

A. B.—The Vanguard Manufacturing Co., Maidenhead, make an ink for writing on plain glass. They list it in the following colours—black, violet, red, blue and green. They also make a preparation called "Subtralene,' for coating glass to enable writing and diagrams to be drawn with pen and ink or pencil, and they also list what they call "Screenolene," an opaque, quick-drying black varnish, which can be used for the making of lantern diagrams in white lines on a black ground by the use of a needle or other fine stylus.

M. B.—The lens appears to be of the portrait type, and possibly the fault of not giving proper definition at the full aperture, which should be *f*/4, is due to the glasses having been misplaced. The glasses of the front combination are pretty sure to be right, but it is possible that the elements of the back combination have got out of place. The flatter curve of the double convex glass, which comes right at the back of the lens, should be in the rearmost position. The most common mistake made in assembling a lens of this type is for this glass to be in the reverse position, in which case a very much smaller area of field is covered. If adjustment of the glasses does not improve matters as regards giving satisfactory definition you had better send the lens to an optician to be overhauled, *e.g.*, to the Premier Optical Co., 63, Bolton Road, Stratford, London, E.15.

X. Z.—(1) We think your practice as regards hardening prints for avoidance of blistering is quite all right. No doubt the use of alum in the first fixing bath does tend to yellowing of the whites owing to the less perfect removal of the silver compounds from the emulsion. If you get sufficient hardening by putting the alum in the third fixing both, we don't think you can do better than stick to this method. (2) No doubt an enamelled iron showcard will withstand the weather better than anything else. Three firms for these enamelled signs are as follows:—(1) Sam Trenner and Sons, 76-78, Gray's Inn Road, London, W.C.1; (2) Macfarland and Robinson, 76-78, Southwark Street, London, S.E. 1; (3) Garnier and Co., 84, Farringdon Street, London, E.C.4. No. 1 has had experience in making signs for photographers in connection with supplying really nice-looking things for war memorials.

A. W.—Correcting the meanings of your symbols:—

x = extra-focal image distance of object at distance $d + f$, i.e., x is distance of exit node of lens from front focus. When focused on infinity the exit node is f from the image.

f = focal length of the lens (not "extra-focal," which term applies only to image and object distance).

d = extra-focal distance of object, i.e., object is at the distance $d + f$ from the entrance node.

With the above signification of the symbols the formula $x = f^2/d$ is quite correct, since it is simply a transformation of the Newtonian formula $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$, as is pointed out by Piper on page 45 of the "First Book of the Lens."

If with the above correction of your symbol-meanings you still find the formula to disagree with the scale marking, it it possible that you are using too approximate a value for f. Do you know the focal length to within, say, 5 per cent.? An error much greater than this would throw out your calculation of the scale division owing to the squaring of f in the formula. Your second question can only be answered by saying that the perspective of the projected picture is independent of the focal length of the taking lens, but is realised theoretically by a view point for the spectator at such a distance from the screen that the angle subtended by the screen at the eye is equal to the angle subtended by the image in the taking camera at the exit node of the lens. If your spectator's distance from the screen is fixed, then, of course, the focal length of the taking lens requires to be such as to fulfil the above condition of angle of view.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3243. Vol. LXIX. FRIDAY, JUNE 30, 1922. Price Fourpence.

Contents.

SUMMARY.

Mr. R. R. Rawkins, in a contributed article, is strong in his recommendation of collodion self-toning papers for professional portraits, and gives numerous hints on their manipulation. (P. 382.)

In a leading article we lay emphasis on some of the features of the Carbro method of making carbon prints. The difficulties of drying and keeping the tissue and of judging exposure are obviated and enlarged negatives dispensed with. (P. 382.)

We renew our cautions to assistants as regards the risks they run of losing specimens of their work by sending them to unknown persons. (P. 382.)

A photographer who had been in turn horse dealer, cab driver, editor, tea agent, dentist's manager, and debt collector, figured in the London Bankruptcy Court last week. (P. 393.)

In a paper from the Eastman Research Laboratory, Drs. Ludwik Silberstein and C. E. Kenneth Mees discuss the evidence supplied by the ultimate structure of the photographic emulsion film in favour of the modern quantum theory of the nature of light. (P. 384.)

The recent paper by Messrs. K. C. D. Hickman and D. A. Spencer before the Royal Photographic Society on the washing of negatives and prints, describes the authors' methods of testing the efficiency of various washing devices by observing the removal of a dye which they had found to be washed out in the same manner as hypo. (P. 387.)

In reference to the paragraph last week, Mr. W. B. Ferguson, K.C., mentions the reasons for which he discarded the use of oxalate in the copper toning bath when working out this process 22 years ago. (P. 394.)

A miniature reflex camera in L tube form has been invented as a focussing finder by an Austrian photographer. (P. 382.)

A correspondent cautions British manufacturers against irresponsible retailers in Japan who pose as wholesalers of standing. (P. 395.)

Mr. Ruddiman Johnston, of Tokyo, has patented a machine for the rotary printing of intaglio-engraved plates, in which the "doctor" is replaced by a rigid corrugated bar. (P. 390.)

Large claims are made in respect to a new developer patented by a German firm of chemical manufacturers. (P. 391.)

The thirty-second meeting of the Photographic Conventions opens on Monday next at Shrewsbury, under the presidency of Mr. C. Bellamy Clifton. (P. 381.)

The making of the ink and a laborious method of transfer without a press are two Continental Bromoil items. (P. 381.)

EX CATHEDRA.

The Convention. Next Monday Shrewsbury will welcome the Photographic Convention for the visit which will last throughout the week. It is the second time that the Shropshire county town has been the headquarters of the photographic gathering. The Convention met there in 1895, under the presidency of the late Mr. Alexander Haddon. This year the evening proceedings, in addition to the presidential address by Mr. Bellamy Clifton, will include lectures by Mr. Alfred Watkins, Mr. C. H. Bothamley and Mr. H. E. Forrest, the latter a lantern lecture on the old houses of Shrewsbury. Excursions will be made to Ludlow, Buildwas, Much Wenlock, Tronbridge, Bridgenorth and the far-famed Stokesay Castle. Old friendships are renewed and new ones made on these annual occasions, and while the Convention preserves the pleasant social character which has prevailed for so many years, it will continue to be a function the discontinuance of which would be regrettable. May its members next week enjoy the fine weather which, at the time of writing, they seem assured of having. In the pleasant Shropshire country and among the many beautiful examples of mediæval domestic architecture which it contains, they will find a multitude of subjects for their cameras.

* * *

Bromoil. Evidently no personal inconvenience or danger is allowed to deter the Bromoil enthusiast from preparing the means which are judged best for his process. Recently, Professor R. Namias, dissatisfied with the commercial inks, has been making his own, and after many experiments has decided that the best is prepared from boiled linseed oil and gum dammar. In a metal vessel, heated over an open fire, he dissolves gum dammar in twice its weight of the boiled oil, afterwards adding the requisite proportion of pigment, *e.g.*, lamp black, burnt sienna or prussian blue. The pigment is mixed with the varnish by putting a little of each on a sheet of glass and grinding with a spatula. If the ink is too hard it may be softened by incorporation of a similar varnish prepared with a smaller proportion of the dammar resin. In a German journal we note also the suggestion by Dr. Emil Mayer of an heroic method of making transfer Bromoils without a press. The principle is the production of great pressure over a minute area by means of a finely-pointed implement. The inked Bromoil is, in fact, laid face down on the transfer paper, smoothed thereon with a straight edge, and its back then "scrumbled" over with a lead pencil, the point of which presses the ink on to the transfer paper as it is firmly moved hither and thither. Even Mr. Bellamy Clifton must quail at the prospect and refuse to be enticed by such inducements as local variations in the transfer "touch." Moreover, Dr. Mayer has his misgivings, for he confesses that the process is "etwas langwierig." We should think so.

Printing Thin Negatives. It is not every photographer who is aware that a better print can usually be obtained from a thin negative by projection, as in ordinary enlarging, than by contact, but the experience of many skilled workers proves that such is the fact. The best results are usually obtained when the negative is illuminated by reflection from a white screen, as in the Boardman apparatus, but excellent results are obtainable with a condenser if one or more thicknesses of ground glass are interposed in the path of the rays. In some cases even a sheet of thin bank post paper may be used instead of glass. If this be done the cone of light from the centre is diffused, and reduction in the size of the diaphragm, which, of course, reduces the light still further, is permissible. When working on this system it is not practicable to use extremely slow papers, but with ordinary slow bromide the exposures will not be unduly prolonged, and in many cases the tone rendering is better than if a vigorous gaslight paper had been used. It will sometimes be found that if a negative be thin, but not flat, the latter papers give a somewhat harsh result, no matter how carefully the exposure is adjusted.

* * *

Assistants' Specimens. Several recent incidents prompt us once again to caution assistants applying for situations advertised in our columns, against sending specimens of their work to advertisers who use a Box No. There is no reason for sending specimens, for our publishers do not allow the request for them to appear in announcements appearing under a box number. Only by observing this rule can assistants assist our publishers in applying an effectual check to the abuse of our advertisement pages by unscrupulous or irresponsible people. Yet we are sorry to find that assistants continue to send what are often valuable specimens to people who are absolutely unknown to them. In such circumstances they have only themselves to blame if they are afterwards unable to obtain re-possession of the examples of their work. We had a case only a few days ago in which an assistant persisted in forwarding specimens to an advertiser unknown to him, after having been several times cautioned against so doing Our publishers' staff endeavour to the best of their ability to frustrate attempts to obtain photographs by underhand methods, and therefore assistants should at least follow the recommendations which will greatly remove causes of complaint respecting the loss of specimens.

* * *

A Focussing Finder. A new form of finder for attachment to a hand-camera has recently been described by an Austrian inventor, Herr Krone, who dwells upon its effectiveness in securing sharp focus in the use of cameras unprovided with a focussing screen. Essentially, there is nothing new in the invention, for the finder is actually a tiny reflex camera, the mirror in which is fixed whilst its lens is moved by the operation of the lens front of the camera to which it is fitted. The auxiliary miniature camera in its simplest form consists of a L-shaped tube having the mirror across the angle of the L, the focussing screen near the top of the upright limb and the lens in the end of the lower horizontal limb. In this pattern the lens requires to be of the same focal length as that of the camera proper; in more elaborate models it may be shorter, so as to permit of reduction of the size of the finder. The worst of such a fitment as this is that it must be attached when required for use, since it is obviously impossible to close a folding camera with it *in situ*. Experience is certainly against the commercial success of a loose accessory of this kind, however effective it may be for its purpose. Moreover, it is difficult to see how the finder can be made efficient, without greatly increasing its bulk, under the conditions in which it is most required, that is to say, when using a large-aperture lens of fair focal length. In these circumstances the focussing finder is almost bound to be pretty nearly as large and as expensive as the camera to which it is to be fitted. Makers of reflex cameras have no reason to fear that their instruments are threatened by devices of this kind.

CARBONS BY THE CARBRO PROCESS.

Theoretically, ordinary carbon printing is a very simple process, and it would at first sight seem almost impossible to make it simpler, but in practice there are little pitfalls which take years of practice to avoid, so that after half a century a really good carbon printer is still the rarest of photographic craftsmen. Those who have made a few dozen prints successfully may be inclined to dispute this statement, but at the end of six months' continuous working of the process they would probably acknowledge that there was still much to learn. This is not said with the idea of disparaging the process, which is well worth the labour of mastering, and which in the process of doing so will probably give very encouraging results. But we wish to point out that unless worked under favourable conditions the operations of sensitising and drying the tissue, the constant variation in sensitiveness which arises from keeping, and the correct estimation of exposure, all call for special care.

Most, if not all, the ills that carbon is heir to are obviated by adopting the Carbro process, which gives as the finished result a genuine carbon print, the ordinary tissue and transfer paper being used. Its chief main difference from carbon is that the image is formed by contact with a bromide print instead of by the direct action of light.

Full working details for the Carbro process are given in the current B.J. Almanac, or they may be obtained from the Autotype Company, who also publish an excellent handbook of the process, so that it is only necessary here to give a brief outline of the necessary manipulations. An ordinary bromide print is placed in cold water to soak. Meanwhile, a piece of carbon tissue of any desired colour is immersed in a solution containing bichromate, ferricyanide and bromide of potassium. In this it remains for three minutes, during which time the bromide print is taken from the water and laid upon a sheet of glass. At the end of the three minutes the tissue is withdrawn from its bath, allowed to drain for fifteen seconds, then immersed in a second solution containing acetic and hydrochloric acids and formaldehyde for an average time of twenty seconds, and squeegeed into contact with the print. It is placed in a fold of grease-proof paper and allowed to remain for fifteen minutes. At the end of this time the two are separated and the tissue squeegeed into contact with a piece of single transfer paper which has been soaked for at least five minutes. The mounted tissue is placed in blotting paper, under light pressure, for at least twenty minutes and developed in the usual way for carbon prints. The bromide print, which will have been wholly or partially bleached, is well washed, to free it from all yellowness and re-developed in amidol, when it is ready to produce another impression. As many as a dozen Carbros can be produced from one bromide, provided it is properly washed and fully re-developed after each bleaching.

The advantages of the process from the professional

worker's point of view may now be discussed, one of the most important being that the necessity of an enlarged negative which is needed for ordinary carbon enlargements is obviated; any good bromide enlargement serves as a basis. As no light is used to produce the carbon image, much time is saved, and there is no guesswork or actinometer needed to judge the exposure. Since also the tissue is used wet from the sensitising bath all drying troubles are eliminated and much valuable time saved. The print is developed upon its permanent support as in ordinary single transfer, but with the advantage of a non-reversed image, so that reversed negatives are not required.

A very interesting feature of the process is the large amount of control over the contrasts of the Carbro print, which can be obtained by varying the time of immersion in the second or acid solution; a brief immersion gives more and a longer one less contrast, thus ensuring the best possible results from any class of bromides. There are, of course, limits to this action, as nothing will put detail into lights where it does not exist, nor may a vigorous print be expected from a flat under-developed original. A somewhat astonishing trait is the fact that shadow detail which has been buried in the development of the bromide original is fully revealed in the Carbro print. Thus any detail which can be seen by holding the bromide print up to a strong light will be reproduced. This is an important point, as it would hardly be imagined that this would be the case. The reason for it is that it is the quantity of reduced silver in the print which forms the carbon image, irrespective of its visual appearance. In extreme cases it is possible to get a good result from a bromide which is nearly black all over by regulating the time of immersion in the acid bath.

Those who essayed the process when it was first introduced by Mr. H. F. Farmer in 1919 and were not satisfied with the results will probably find their difficulties removed by trying the modified procedure of Mr. F. Garon, which has now become the standard adopted by the Autotype Company. If for any purpose a reversed print or a non-reversed one from a reversed negative is wanted the tissue may be squeegeed upon flexible support or waxed opal and treated as for ordinary double transfer. For Carbros on ivory the bromide may be made by reduction in the lantern or camera, the glass side of the negative being turned to the lens. This gives a reversed bromide, which by double transfer is correct upon the final support.

SELF-TONING COLLODION PAPER FOR PORTRAITS.

Is the print-out paper for portraits likely to be popular again?

There are many indications that point to a revival of daylight printing processes, especially collodion. It appears, however, that P.O.P., which requires a separate toning bath, is on its last legs. At the Photographic Fair the collodion self-toning papers were much in evidence, and there is now a healthy competition amongst British manufacturers which will do a great deal in popularising this beautiful process.

I have found the average professional photographer inclined to be a trifle contemptuous in speaking of self-toning papers. One photographer said to me: "It is an amateur's paper, and no earthly good to the professional who wants his results to *stand*." It seems pretty clear that there is a general feeling that these papers do not give permanent prints, but I am convinced that this is an entirely erroneous idea. It is all a matter of correct treatment in fixing and washing. I have seen collodion self-toning prints that were made thirteen years ago, and I have many of my own (on Paget and Seltona) over twelve years old, which are quite as perfect now as when first produced.

It must therefore be a matter of correct technique, and the object of this article is to endeavour to point out possible errors in manipulation.

It may be argued that the demand for speed, which is so insistent nowadays, absolutely precludes the use of a paper that demands a printing-frame and visual examination. But, does it? It is admitted that the process may not suit the cheap post-card man (although I know one man who is doing a good business by it), but with girl labour under supervision it is surprising how many prints can be obtained in a day without much waste. Print-out photographs are invariably approved by the general public, and every practical photographer will agree that there is "something" about a print-out picture that makes it different from a development picture.

The richness of tone, complete absence of hardness or excessive contrast, and the rendering of a long scale of gradation are the principal attributes of the self-toning (collodion) papers. It must be borne in mind that the great general public are becoming more discriminating, and by practising photography as a hobby their knowledge of processes is increased. Nowadays a very large section of the public regards the "soot-and-whitewash" postcard as anathema; and rightly so. Photographers know that these "hard" things do not represent the possibilities of the bromide process, but they are foisted upon certain sections of the public as "good" pictures.

Here, then, is a great opportunity for the portraitist to introduce a new "line," which will, I feel sure, be a financial success, provided the technical management is on the right lines. Look at the surfaces and colours that are now obtainable! The cream matt and rough surface give pictures of singular beauty and distinction, and it is practically impossible to get double tones.

As regards the technical side of the question one is quite safe in following the makers' directions, but there is considerable difference of opinion as to whether the prints should be washed before fixing. With one paper my practice was to place the prints direct into the alkaline fixing bath, but I must confess to a liking for a paper which has to be washed first.

In toning a large batch there appears to be less chance of chemical complications when the prints have had a preliminary wash to remove the "free" silver. The glossy papers usually require to be placed first in salt solution, so as to obtain the purple colour which is suitable for this surface.

The class of negative best suited to collodion self-toning paper is one on the thin side, but not weak. The glossy paper gives greater contrast than any other surface. A very hard negative with clear glass shadows is apt to give bronzed darks in the print, unless a little colour or matt varnish is put on the negative. A great deal can be done in the way of sunning down excessive contrast, and in the practice of centralising the lighting a local exposure of the printed picture to daylight will do all that is required.

The process is of no use to the slap-dash worker who uses one dish for everything. To be entirely successful it is necessary to be very methodical and clean. The dishes used for the preliminary washing must not be used for the hypo solu-

tion, or for the washing after fixing. Quick changes from one dish to another is a good way of removing the "free" silver, and fixing should not be done until the washing water remains quite clear.

The washing and fixing should be done in large shallow trays, and the prints handled face down, so as to minimise curling. With this process there should be no leaving the prints to soak or wash. They must be kept on the move all the time, and not left until they are hanging up to dry.

The hypo solution should be freshly made, of a strength 3 ozs. to the pint of water, and if there is the slightest suspicion of the bath being acid a few drops of ammonia or a pinch of bicarbonate of soda must be added. As regards the number of prints that a given amount of hypo will fix perfectly, a good guide is to use just as much solution as will allow of the prints being handled comfortably in it. The hypo solution must not have been used before for any other purpose, and a full ten minutes must be allowed for fixation.

The washing to remove the hypo must be very thorough; at least eight complete changes should be given, occupying a total time of one hour. The prints can then be placed on a slab of clean, thick glass, one on top of the other, and firmly squeegeed to remove some of the water. The face of each print should be blotted with a chemically-pure blotting paper, and hung up to dry. I find that a very convenient method of drying is to use American wooden clips threaded through galvanised wire, and to hang the prints in pairs back to back. This prevents a great deal of curl. When dry the prints should be straightened in the usual way, but if heat is used to dry them (which can be done quite safely) they should be straightened before they are bone dry.

There is one other item which is an essential to permanence, and that is dry-mounting by the hot press. The dry-mounting tissue interposes a thin layer of waterproof material between the mount and the picture, thus preventing any possible emanations from the mount affecting the picture.

The glossy surface can be glazed on glass, but I find a much better method of obtaining a high gloss is by the use of encaustic cereate, or Lustralene. A little of this rubbed on with a piece of flannelette and polished with another piece of soft material will give a good gloss with the added advantage of removing all traces of bronzing in the shadows. This paste can be used on the other surfaces if desired, and will make the shadows appear rich and luminous. Further, this thin coating of paste must afford considerable protection from damp, the products of combustion, or impure atmosphere, thereby ensuring permanence. Spotting or working up should be done before treating with the paste, and will not rub off if handled gently.

In conclusion, there is no sepia or brown tone obtainable on any development paper that will surpass the rich colours so easily obtained by the self-toning collodion process.

R. R. Rawkins.

PHOTOGRAPHIC EXPOSURE AND THE STRUCTURE OF LIGHT.

(Communication No. 144 from the Research Laboratory of the Eastman Kodak Company.)

The method by which a photographic emulsion adds up light during a long exposure has always been a problem for which no adequate explanation was forthcoming. The sensitive material in the emulsion consists of microscopic crystalline grains in the form of flat triangular or hexagonal plates of a variety of sizes, ranging from spots which are only visible as specks under the highest power of the microscope to crystals which are easily visible and show clearly defined form. If these grains are exposed to light and receive a sufficient exposure, they become developable, and it is generally considered that once a nucleus for development has been formed the entire grain will be reduced to metallic silver if developed for a sufficiently long time.

Keeping this in mind, consider an emulsion exposed in a telescope to the image of a star, for instance. At the end of a very short exposure apparently no grains at all might be developable, and no image of the star would be obtained. Nevertheless, some change has occurred to the grains if we accept the idea that they have been continuously exposed to light, because, if we go on exposing, presently some of the grains will be developable, and after hours of exposure enough grains will be developable to make a good image of the star.

If we think that the light is falling continuously on the grains, then they must have some mechanism for storing extremely small amounts of energy below that necessary to make them developable until they have enough for developability. It is not impossible that some chemical mechanism could be conceived, but the problem presents some difficulty, especially as the effect of an exposure is not greatly lost on interruption. On the assumption that the grains are continuously acquiring exposure, we must assume that they will not lose, even after weeks, their record of an exposure insufficient to make them developable and will re-start exposure practically where they left off.

Another difficulty which arises when we study the exposure of the individual grains is that they appear to differ in sensitiveness; the bigger grains behave as if they were very much more sensitive than the smaller, and there are often differences in sensitiveness among grains of the same size, because if we sort out a number of grains, all of the same size and shape, under the microscope, they will not all become exposed at the same time; some of them will become developable before others, and if we imagine that they have all been exposed to a uniform continuous flood of light we must admit that these grains differ in sensitiveness among themselves. This has recently been dealt with by Svedberg in his paper on the relation between sensitiveness and size of grain in photographic emulsions.[1] Svedberg finds that the centres of reduction in exposed grains are distributed according to the laws of chance. In the discussion of this paper Dr. Lowry suggested that it might be that these developable centres provided a concrete record of the bombardment of the silver bromide targets by quanta of light.

The situation is similar to that which a row of soldiers in the trenches would present to a spectator who had no idea of the existence of projectiles on the battlefield. He would observe men falling, and would conclude that there was a continuous wave of death coming over from the enemy's trenches, and that the soldiers differed in their "sensitiveness" to death, so that one man was killed while another remained apparently unhurt, though if they remained exposed for a sufficiently long time ultimately all would be destroyed.

If we had no prior knowledge of the wave theory of light, the simplest explanation of the apparent difference in sensitiveness of different grains would be that, instead of a continuous flow of light in the form of waves on to the sensitive film, the light was falling upon it as a rain of projectiles; these projectiles would make developable any grains that they hit, the grains which were missed not being affected at all. If the grains continued to be exposed to the radiation they would be hit later and thus be made developable in their turn.

The radiation of light in the form of projectiles is a very old idea in physics. Indeed, the theory which Newton held as to the nature of light was that it consisted of a stream of very minute corpuscles moving with great velocity and bombarding the material objects which they met. This theory was displaced by the wave theory

1. "Phot. Journ.," April, 1922, p. 186.

owing primarily to its inability to explain the phenomenon of interference, but many recent discoveries in physics have been found difficult to explain by the use of the classical wave theory, and it seems not unlikely that it may be necessary to turn to a theory having some analogy to the corpuscular theory of Newton.

The origin of light-emission is now ascribed, not to the molecules of matter or even to the atoms as a whole, but to the "electrons" or smallest particles of negative electricity in their interaction with the nucleus of the atom. There are good reasons for assuming the atoms of the chemical elements to consist of a "nucleus" carrying a positive charge of electricity surrounded by one or more electrons carrying negative charges, the whole atom being electrically neutral. It is thought that these electrons revolve about the positive nucleus, more massive than the electrons, and that on their number and the corresponding charge on the positive nucleus depends the nature of the atom. Thus hydrogen, the lightest of all elements, has one electron revolving in a circular or elliptic orbit about its nucleus. Helium, the next element, has two electrons; lithium, three; and so on.

The electrons are supposed to revolve around their nuclei without radiating, but when an electron suffers some violent shock it jumps from one of these so-called "stationary" orbits to another and gives up energy, which is radiated out in the form of waves having the very remarkable property that the frequency of the vibration emitted is exactly proportional to the energy which is released. The wave-length, of course, depends upon the frequency; the more waves there are emitted in a given time the shorter their length must be, since the velocity of light is constant; so that when an electron loses a very little energy it gives out long waves, and when it loses a great deal of energy it gives out very short waves.

In an X-ray tube the discharge of electricity is in the form of a stream of corpuscles travelling with a velocity which is very high and which depends upon the voltage of the electric current applied to the tube. When these corpuscles strike the target their energy is radiated in the form of X-rays, and we know now that these X-rays partake very closely of the nature of light, except that the length of the waves is about one-thousandth of those of light, or, what is the same thing, their frequency is a thousand times as great. It is to this that they owe their great penetrating power.

On the classical wave theory of light, then, we should imagine that an X-ray tube, having its target bombarded by the stream of corpuscles produced by the current, would emit waves of X-rays spreading into space just as waves of light are imagined to spread from a source; but now comes a great difficulty: When these X-rays, travelling out, pass through a gas and are absorbed, they cause the molecules of the gas to emit electrons, and these electrons are emitted with almost exactly the same velocity as the electrons in the tube which produced the X-rays themselves.

The possibility of applying the quantum theory of radiation to photographic exposure has been hinted at by a number of writers before the paper already referred to by Svedberg. Thus, it is mentioned by F. E. Ross[2], who notes that such a theory would lead to a mass-law formula for photographic exposures, but does not enter into the details of the probability problem, and does not develop the theory. R. E. Slade and G. I. Higson[3] consider the possibility of a light-quantum theory, and write a formula (of the Elder type) for the exposure of a photographic material with the qualitative comment that on such a theory the coefficient of the formula would vary with the size of grain, but since such a theory will not lead directly to an explanation of what is known as the failure of the reciprocity law they abandon it as "impossible."

In the discussion of Svedberg's paper, Mr. Storr and Mr. Hickman pointed out that the results obtained could be explained either by assuming a discrete structure in the light or by assuming some specific distribution of sensitiveness in the grains themselves prior to and independently of the light-action.[4] Such a theory will certainly present considerable difficulties before it can be reconciled with the experimental facts to be described presently, but in the research laboratory of the Eastman Kodak Company work is in progress by means of which it is hoped to decide definitely for or against the latter theory.

A consideration of the subject led L. Silberstein to develop a mathematical theory based on Einstein's assumption of light-quanta; i.e., of a discrete structure of radiation which, together with several experimental tests, was given by him in a paper read December 28, 1921, at the Toronto meeting of the American Physical Society. The experimental work by A. P. H. Trivelli and I. Righter undertaken in the research laboratory of the Eastman Kodak Co., with the purpose of testing this theory, has provided ample evidence as to the relation between the size of single grains and of clumps of grains and the percentage of them which become developable on exposure. Their results agree very well with the deductions from Silberstein's theory. This work of Silberstein and that of Trivelli and Righter corroborating experimentally his theoretical formula are now being published in the "Philosophical Magazine," to which readers are referred for all details and the mathematical treatment of the problem, while in the present article but a bare outline of the subject can be given.

According to Einstein's hypothesis of 1905, light may be considered to be radiated and propagated in quanta, which consist of limited trains of monochromatic light-waves, each train containing a quantum of energy, the value of which is the product of Plancke's constant h and the *frequency*. Somewhat more generally, it may be assumed, as has been done by E. Marx and J. J. Thomson, in distinction from Einstein, that not the whole radiation but only part of it is split into these quanta, the light-energy being densely concentrated in minute specks scattered haphazard over an otherwise continuous distribution of radiant energy. Further, according to Einstein's photo-electric law, verified most accurately by numerous experiments, the liberation of a photo-electron from an atom requires just one quantum of light-energy, which reappears as the kinetic energy of the ejected electron, except for the fraction used up in freeing the electron.

Now, Jolly has already suggested that the mechanism by which a silver halide grain is affected by light is such a photo-electric liberation of an electron, and the combination of the two theories leads us at once to a view of light-quanta travelling independently of each other in the form of limited trains of waves of a minute cross-section and striking the crystal grains in such a way that they are absorbed and, upon absorption, liberate an electron.[5] For these light-quanta Silberstein has suggested the term "darts of light." He has calculated the chance that a grain of any size would be hit by such a projectile and would thus become developable. Naturally, the bigger the grains, the more likely are they to be hit, so that a relation can be found between the size and the number of grains which will become developable after a given exposure.

If k be the number of grains which have been affected by an exposure to n light-quanta, the grains having a projective area a; and, if there are N grains to be affected, the rigorous and rather complicated probability formula gives for large values of N and any n, with more than sufficient approximation,

$$k = N(1 - e^{-\frac{an}{N}}) \qquad (1)$$

This follows under the assumption that the cross-section of the light-darts is negligible as compared with a. If that cross-section, say δ on an average, is taken into account, and it is required that the grains to be affected should be fully hit by the light-darts,[6] the somewhat broader formula,

$$k = N(1 - e^{-\frac{an'}{N}}),\ a' = n\left(1 - \sqrt{\frac{\delta}{a}}\right)^2 \qquad (2)$$

is obtained.

When the equation (1) was compared with experimental results it was found that the bigger grains become affected even more quickly as compared with the smaller grains than they should have done according to this formula. A possible explanation of this is that we cannot assume that the cross-sections of the light-darts are of negligible area compared with the grain, and it may be that they have appreciable diameters, varying over a wide range, but of an average size comparable with that of the smaller grain. If such be the case and the broader formula (2) is applied, then, from the rate at which the grains of different sizes become developable, the average cross-section area of the light-darts, or whatever the parameter δ stands for, can be calculated.

Trivelli and Righter, studying the sensitiveness of clumps of grains formed by the attachment of two or more small grains together, found experimentally that if one of these grains is affected

2. "Jour. Opt. Soc. Amer.," Volume IV., 1920, p. 256.
3. "Proc. Roy. Soc.," Volume 98, 1920, pp. 164-170.
4. This was also suggested and discussed by S. E. Sheppard in a recent paper on "Size Frequency Distribution of Particles of Silver Halide in Photographic Emulsions and its Relation to Sensitometric Characteristics." See also paper on "Action of Soluble Iodides and Cyanides on Emulsions," "Phot. Journ.," Feb., 1922.

5. It is by no means certain that the mere liberation of an electron is a sufficient cause for developability.
6. Always of sufficiently high frequency, i.e., exceeding the critical frequency below which no photo-electron is liberated.

by light, the whole clump becomes developable.[7] Thus, a clump of four small grains will act just as if it were one large grain or target of just the same total area, due allowance being made for the overlapping of the grains. It is consequently possible to calculate the rate at which clumps containing different numbers of grains will be affected by the light, and when the experiments were made and the numbers of affected clumps containing two, three, four, and more grains were counted, it was found that these numbers agreed very closely with those which were calculated by means of the aforesaid formula (2).

In Trivelli's and Righter's work a simple bromide emulsion of minimum speed and contrast, and having grains of an average size (area) of about 0·9 square micron, was used for the experiments. The experiments were performed as follows:—A plate coated with the original emulsion was soaked in distilled water for half-an-hour and then covered with a warm solution of gelatine, alcohol, and water, in which it was maintained at a temperature not over 40 deg. C. for 20 minutes. By this means the emulsion was removed from the plate, and the solution was then diluted, so that upon coating and drying a single layer of grains was obtained on the glass plate. After exposure in a sensitometer the plates were developed to γ_∞, washed, and the developed silver removed with a dilute solution of chromic and sulphuric acids. The strips thus treated contained the undeveloped grains and clumps, and the numbers $(N-k)$ of the grains and clumps of different sizes (a) thus left unaffected were counted. Subtracting these numbers from the numbers N of grains and clumps originally present, the numbers k of grains and clumps affected were obtained. So far only the first three "steps" of an H. & D. sensitometric strip have been counted, a week or two being required for the area measurements and counts relating to each step. Twenty of these on each of three strips are employed to determine the developed grains, while to determine the number of grains and clumps in the original one-grain-layer plate before exposure and development ten of these on each of four strips were used. The results in both cases are reduced to the number of grains or clumps per square centimetre of a one-grain-layer plate. The following table shows the results obtained for the first step, as compared with the values calculated according to Silberstein's formula (2) with $n=0.572$ per square micron, and the "average" area of the cross-section in a light-dart $\delta=0.097$ of a square micron:—

Clumps of	a in μ^2	$\frac{100k}{N}$ Observed	$\frac{100k}{N}$ Calculated
1 grain	0.75	16.5	15.2
2 grains	1.93	44.9	48.4
3 ,,	3.03	76.6	68.9
4 ,,	4.88	87.1	87.3
5 ,,	6.20	96.0	93.3
6 ,,	7.40	98.2	96.4
7 ,,	8.6	100.0	98.0
8 ,,	9.8	100.0	99.6
9 ,,	11.0	100.0	99.8
10-31 ,,	12-23	100.0	100.0
32 ,,	> 24	100.0	100.0
33 ,,	> 25	100.0	100.0

The most reliable a values are those for the clumps of one and of two grains, being averages of the largest numbers of individual clumps; the following a values are gradually less reliable. The calculated values in the above table were obtained from the equation (2) given before, containing a term which allows for a finite cross-section and hence a finite diameter of the light-dart, the average diameter according to this calculation being approximately one-third of a micron, and the number of light-darts falling on the plate for this exposure being about one for every two square microns.

The above value of n would give approximately 57,000,000 light-darts per square centimetre; a judgment whether this allots to each dart just one quantam of energy in Plancke's sense of the word must be suspended until absolute energy measurements of the exposures are available. Since each light-projectile is presumably of the order of some hundred of thousands wave-lengths in length, the name "light-dart" seems not inappropriate in view of the assumed small cross-section. On Einstein's own theory there is nothing on which to base the estimate of the dimensions of the light-quantum,[8] but on Thomson or Marx's less radical theory of "concentration places" within a continuous distribution of light-energy the characterisation of a light-dart as having a section of $0.097\mu^2$ would mean a length (at wave-length $470\mu\mu$) of abont 6,000,000 wave-lengths. When the measurement of the second "step" of the sensitometric exposure was completed, the same value of the cross-section of the light-dart was taken, but with the exposure value of half that of the former set, i.e., $\delta = 0.097$ and $n = 0.286$. The experimental results (apart from the second doubtful item) agree admirably with the calculated ones, as is shown by the following table, thus forming a striking confirmation of the theory:—

a in μ^2	$\frac{100k}{N}$ Observed	$\frac{100k}{N}$ Calculated
1.93	21	28.2
3.03	57	44.2
4.88	63.8	64.3
6.2	74.5	74.3
7.4	87.5	81.0
11.0	97	92.4
12.0	97	94.2
12-23	100	96-100
24	100	100
25	100	100

Similarly, for the third "step" the same formula, but with the exposure value of one-half of the second step ($n = 0.143$), gave the percentage numbers of clumps affected (for clumps of 2 up to 10 grains), 15, 25, 41, 49, 56, 63, 68, 74, 76, agreeing well enough with the observed values, which were 13, 38, 42, 53, 66, 82, 86, 78, 89 respectively. An account of further measurements in this and other sets of experiments now in progress will be published as these are completed.

Naturally, many questions relating to this theory come to our mind: Are we to suppose all the light-darts of the same average diameter or does the average diameter depend upon the frequency? How are we going to explain the difficulties of interference and diffraction of light? We are far from being able to answer these questions. Some of them can perhaps be dealt with experimentally, some mathematically, some will have to wait for new facts and new methods of attack. As soon as the photographic measurements can be made it will be possible to determine whether the darts of X-rays, for instance, behave similarly (and as if they had the same diameter) to darts of visible light. This may settle the question as to whether the light darts vary in diameter with the frequency. The problems presented by interference and diffraction can perhaps be dealt with statistically. All that we can say at present is that it is not impossible that these phenomena may be explained on the hypothesis that light consists of separate trains containing many waves of light. The mechanism by which an electron emits a light-dart, which, moreover, satisfies the relation between its energy and the frequency of the radiation emitted, is, and will perhaps for a long time remain, entirely unknown. Since the amount of energy in a light-dart is very small, light of ordinary intensities contains enormous quantities of them, and it is only in exceptionally favourable cases that any distinction could be detected in the effects produced upon matter between a continuous radiation of energy as demanded by the older theory and a shower of projectiles or light-darts. A rain of arrows, for instance, if sufficiently closely packed would have just the same effect upon a material as hitting it with something solid; it would make practically no difference that the arrows are separated by small intervals in space and time, and in the same way we should expect that the continuous wave theory would appear to hold except where we might have methods of exposing an assemblage of sufficiently small individual particles to a shower of light-darts *not outnumbering the particles very much* and observing what happened to them. Such conditions are precisely afforded by properly prepared photographic emulsions, which thus seem admirably adapted to reveal the discrete structure of light.

7. Although Svedberg obtained in his recent investigation ("Phot. Journ.," April, 1922, p. 183) what would seem an independence of the grains forming a "clump," yet Trivelli and Righter are confident in their result which they have repeatedly verified. The apparent discrepancy is probably reducible to the circumstance that Svedberg worked with small spherical grains which have not been in such an intimate contact with each other as Trivelli and Righter's plate-shaped grains, partly overlapping and piled upon each other.

8. In his original paper of 1905 ("Ann. der Physik," Vol. 17, p. 132) Einstein speaks of each quantam of light-energy as concentrated in a "space-point," but this is scarcely more than a brief expression, and is certainly unessential for Einstein's reasoning.

When a beam of X-rays falls upon an atom and liberates an electron we have the means of detecting the action of a single quantum, which is necessary in order to detect the difference between a continuous radiation and a shower of light-darts, and the observation that the electron thrown out of an atom by impact of X-rays travels with the same speed as the original electron by which the rays were generated is exactly what we should expect to be true on the light-dart theory. This theory, of course, is, as yet, in its infancy, and there are many difficulties which it will have to meet, but if we had not been, for several generations, under the influence of the continuous wave theory of light and were considering only the facts known to us, it is quite possible that the difficulties presented to the ordinary wave theory by the photo-electric effect, the absorption of X-rays, and the behaviour of the photographic plate would appear not less formidable than those which the problems of interference and diffraction actually present to the light-dart theory. Fortunately, the theory leads to many experiments, and one may perhaps be able to come to definite conclusions as to its value as soon as the experiments which are indicated can be carried out.

LUDWIK SILBERSTEIN.
C. E. KENNETH MEES.

THE WASHING OF NEGATIVES AND PRINTS.

[A paper recently read before the Royal Photographic Society by Messrs. K. C. D. Hickman, B.Sc., and D. A. Spencer, A.R.C.Sc., entitled, "A Constructive Criticism of Washing Devices and Optical Method of Testing," has been printed in the Society's "Journal" as the first part of a comprehensive communication on this subject. As will be seen, as soon as one has crossed the formidable barrier of the chemical equations and mathematical formulæ, one encounters a great many experimental data bearing directly upon the practical methods of washing negatives and also prints. With much ingenuity the authors illustrate side by side their experiments and the results obtained as regards uniformity and completeness of washing, and they describe their inventions for the washing of plates, among them one which has already been placed upon the market in the shape of the Hickman "Circulator." The paper certainly represents the most scientific experiments which have been made on the removal of hypo from gelatine films by washing, and are deserving of a close study on account of the great amount of practical information which it contains.]

THE theoretical side of washing by successive changes of water has been dealt with recently by Elsden[1] and Warwick,[2] who have shown that complete removal of hypo from a photographic plate can be obtained in a short time with a small expenditure of water.

An editorial note[3] on Warwick's paper remarks:—". . . it would seem that Mr. Warwick adopts a higher standard of freedom from hypo than that chosen by Mr. Elsden. Such standard, in the absence of experimental evidence, must be a matter of choice."

This experimental evidence is difficult to obtain, but the necessary degree of freedom can be deduced on theoretical grounds. Lumière[4] states that the fading of silver prints is probably due to conversion of the silver to sulphide, and brown Ag_2S turning to a light yellow variety in the course of years.

We agree that the conversion to sulphide probably occurs; but can find no evidence to support the theory of a more stable allotropic form. It would appear more likely that the silver is converted through sulphide to sulphate, which, in the presence of sulphuric acid or other hygroscopic material, is able to diffuse laterally, or into the support.

Assuming a photograph to be perfectly fixed, and the absence of silver thiosulphate in the film, the process of fading might be explained as follows, the upper arrows showing the direction in which the equilibrium sets.

(1) $2Ag + Na_2S_2O_3 \rightleftharpoons Ag_2S + Na_2SO_3$.
(2) $2Na_2SO_3 + O_2 \rightleftharpoons Na_2SO_4$.
(3) $Na_2SO_4 + Ag_2S \rightleftharpoons Na_2S + Ag_2SO_4$.
(4) $Na_2S + CO_2 + H_2O \rightleftharpoons Na_2CO_3 + H_2S$.
(5) $Na_2S_2O_3 + 2O_2 + H_2O \rightarrow Na_2SO_4 + H_2SO_4$.

Equations (1), (2) and (5) show that there is a tendency for the formation of silver sulphide and an excess of sodium sulphate. All reactions being strictly reversible, minute quantities of sodium sulphide and silver sulphate will be formed as in (3), and the sodium sulphide will be decomposed by atmospheric gases (4). As hydrogen sulphide precipitates silver sulphide quantitatively from sulphate solutions, it will require a large excess of sulphate, and complete removal of H_2S, to reverse the reaction. These conditions exist, however, in a photographic film containing sodium sulphate and sulphuric acid, from which the gas is freely permitted to escape.

It will be assumed, then, that thiosulphate is comparatively harmless when it is present in proportions indicated by equation (1), a change to sulphide only slightly altering the colour. This quantity must be calculated for the lowest density which it is desired to preserve. Taking this as $d=0.1$, and the photometric constant as 0·0103 gramme Ag per 100 cms.[5] for plates, then the greatest permissible quantity H of hypo per square decimetre is given by $H = 0.0103 \times 0.1 \times 1.5 = 0.0016$ gramme, where $Na_2S_2O_3 : Ag :: 1.5 : 1$. This is a maximum quantity, and a safety factor of 10 is suggested, bringing the limit to 0.00016 gramme, or 0.0013 gramme per quarter-plate. In the following experiments, therefore, a plate is considered completely washed when it contains less than this amount.

Soluble salts in general are said[5] to diffuse exponentially with time from gelatine films into water. This was verified for hypo diffusing from gelatine-coated negative plates into water, two series of experiments being performed. (1) Freshly fixed plates were soaked in successive changes of water, time being allowed for the concentrations in film and liquid to reach equilibrium. (2) Plates were washed with large quantities of water, projected at their surfaces with as great a velocity as the films would stand. The results in the first case were contradictory amongst themselves, the discrepancies being attributed to a faulty experimental method. It is hoped to deal with the matter in a further paper. Experiments (2) indicated that under the second conditions the exponential law held good, the quantity of hypo diffusing away at any time being proportional to the amount left in the film at that moment. The quantity of hypo M, washed out of the film in a period t minutes from the start is given by

$$\frac{dM}{dt} = K(A - M),$$

where A = quantity of hypo originally present, and K is the elimination constant for the film.

$$\text{Then } \int \frac{dM}{A - M} = \int K dT$$

$$\therefore \log \frac{A}{A - M} = Kt,$$

$$\text{whence } K = \frac{1}{t} \log \frac{A}{A - M},$$

which may be written:

$$K = \frac{1}{t} \log \left(\frac{\text{initial concentration in film}}{\text{concentration at time } t} \right).$$

The value K is independent of the initial concentration and may be obtained from

$$K = \frac{1}{t_2 - t_1} \log \left(\frac{\text{concentration at time } t_1}{\text{concentration at time } t_2} \right).$$

Whence, the time required to reach any limiting concentration C_L is given by:—

$$t_L = \frac{1}{K} \log \frac{C_n}{C_L} + t_n,$$

where t_n is any given time.

1. "B.J.," 1917, 120.
2. "B.J.," 1917, 261.
3. *loc. cit.*
4. "B.J.," 1902, 226.
5. Sheppard and Mees' "Theory of Photographic Processes."

Clearly, these equations cannot be used to predict the time of washing for any case in which the exponential law does not hold good. In most methods of washing met with in practice, a state of affairs somewhere between the two cases is found. This has been allowed for by previous workers by using the exponential formula and varying the factor K to suit the altered conditions.

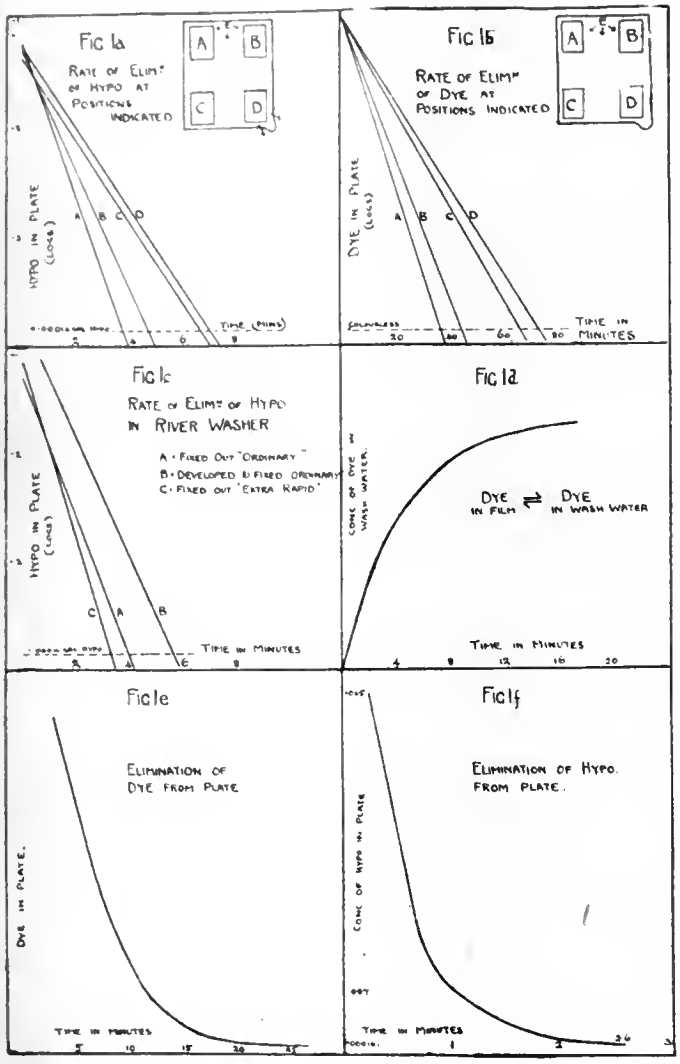


Plate 1.

This is, at best, a makeshift. The particular value to an investigator, of a formula for deducing the time for complete washing lies in the unreliability of volumetric methods of estimating hypo. In titrating with iodine, the correction to be applied for the starch used as indicator is often greater than the value of the thiosulphate found when the latter is only present in minute amounts. It is therefore difficult to tell if a plate is completely washed by titrating the residual salt with iodine and starch. The method becomes accurate, only when the hypo content is great, *i.e.* in the early stages of washing. Here the time error is large owing to the difficulty of placing and removing the plate sufficiently quickly from the wash water, of blotting evenly, and preventing diffusion to adherent solution while doing so.

The validity of our experimental results depended, other factors being constant, on the similarity of gelatine thickness, hardness, etc., and the maintenance of a similar working temperature for each plate. Adequate precautions were taken to ensure regularity of conditions and, where possible, each series of experiments was conducted on large plates cut into strips. In each case a portion of the plate was dyed in Tartrazine,[6] and the diffusion time for the dye under standard washing conditions noted. This enabled a small correction factor to be applied. In experiments (1) above, the wash waters were united and titrated with N/100 iodine. Plates in experiments (2) were washed in four successive changes of water, for five minutes each, and the washings titrated as before. The washing times in the latter case are plotted against the logarithms of the hypo concentrations in Fig. 1*f*, Plate 1. The time for washing to the limiting concentration is thus only 2.6 minutes under these abnormal conditions. The plates adopted throughout the experiments were "Wellington" Ordinary. They were soaked in water for 10 minutes, then for two changes of 5 minutes each in 20 per cent. hypo, after which they were used.

In order to test whether the omission of development prejudiced the results, four plates were fogged, developed in metol-hydroquinone to a uniform density of about 0.5, washed, and treated as before. It was found that considerably more hypo was absorbed, but that it washed out at approximately the same rate as that from an undeveloped plate. This, together with a comparative curve for ordinary and extra speedy press plates, is shown in Fig. 1*c*, Plate 1. The curves were obtained by means of the river washing device.[7]

Until a method of measuring very small quantities of hypo becomes available, it is necessary to attack the problem in a different manner. An ideal weapon would be provided by a highly-coloured salt having the molecular weight and other physical properties of hypo. This could be used to bathe plates, and the manner of washing noted visually. The subject could then be attacked qualitatively as well as quantitatively in a manner which appears previously to have been overlooked. Qualitative examination is important because a plate may contain less than the theoretically objectionable quantity of hypo calculated for its entire surface, but this quantity may be, and often is, located in a small area where it can do great harm. Qualitative examination should reveal local concentrations, and thus indicate the forms of apparatus which give faulty washing.

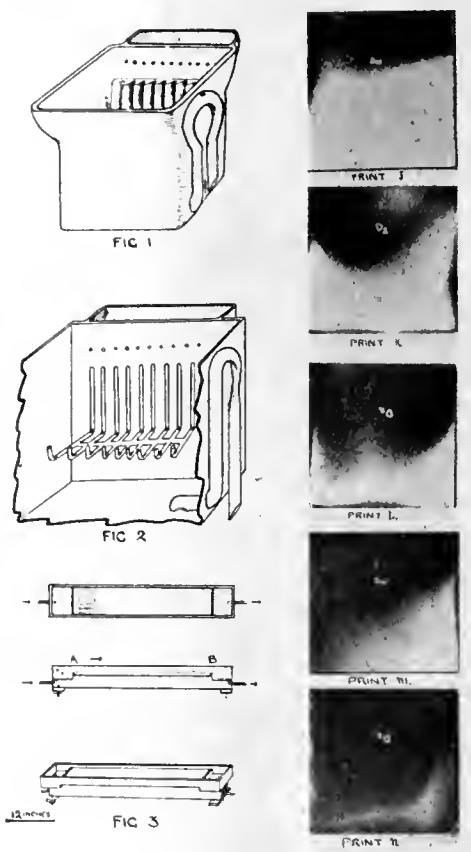


Plate 2.

Most highly-coloured inorganic salts modify gelatine and are unsuitable for the purpose. A number of dyestuffs were examined, and a few selected, which diffused from gelatine without leaving

6. See later.

7. See later.

a stain. Of these, Tartrazine[2] was shown to diffuse exponentially with time, plates dyed for 3 minutes in 2 per cent. solution clearing in about 30 minutes in running water. The curves for the rate of elimination and for the attainment of equilibrium with wash water are given in Figs. 1*d* and 1*e*, Plate 1. The times of diffusion and attainment of equilibrium are much greater than for hypo, alteration of the conditions of washing affecting the two differently, though in the same direction. Increase in the quantity of wash water causes both dye and hypo to eliminate more quickly. The dyed plate, taking longer to reach equilibrium, will be less affected by an irregular water supply, any selective washing indicating an even greater lack of uniformity had hypo been used. It is thus quite suitable as a qualitative substitute for the latter.

Plates were fixed, washed, and dyed in 2 per cent. Tartrazine for 3 minutes and dried. To test the efficiency of a washing device, one or more plates were placed in it, and the time noted for complete removal of colour. If irregular washing occurred, it was recorded by removing the plate, blotting the surface, and making a print from the glass side on to "vigorous" gaslight paper, using a metal filament lamp, screened by a solution of ammoniacal copper sulphate to give maximum contrast with the yellow dye.

As a preliminary, the water-changing properties of the various washing devices were examined. Taking as standard an imaginary washer which received and discharged water at a uniform rate, the incoming stream mixing perfectly with the contents of the vessel before discharging, it will be seen that washers may be divided into those which are more, and those which are less efficient than this theoretical example. Thus, water falling into the deep end of a tilted dish will overflow before it has diluted the contents, and the replacement will be less efficient than the example cited. On the other hand, with the intermittent siphon tank (Fig. 2, Plate 2), where the incoming water displaces the old solution with little mixing, the dilution is very rapid. The rate of dilution (obtained by estimating tintometrically the decrease in strength of a dye solution placed in the washer) was found quantitatively for all the apparati which were used. The results are given in Plate 3.

It would be expected that if the rate of plate washing were a function of the efficiency with which stale solutions were removed from the washing device, plates would wash quickest in apparati giving the steepest curves. The experiments with dyed plates proved that this was not always the case. The tests with these plates are tabulated below.

(Experiments shown in Plate 4.)

Fig. 1.—Water delivered at 81 litres per hour, falling on centre of lantern-plate in ¼-plate dish. Plate, colourless in 30 minutes. Prints (*a*) and (*b*) after 12 and 17 minutes respectively.

Fig. 2.—Ditto, falling on centre of long side of ¼-plate dish and issuing at opposite side. Plate, colourless in 38 minutes. Prints (*c*) and (*d*) after 16 and 30 minutes; and

Ditto, falling on centre of short side of dish. Clear in 30 minutes, and print (*e*) after 20 minutes.

(Experiments shown in Plate 5.)

Ditto, falling on lip corner of dish, plate colourless in 34 minutes, prints (*f*) and (*g*) after 15 and 25 minutes.

Fig. 1.—Water falling on centre of ¼-plate at 81 litres per hour, plate supported directly under stream, *i.e.* not in dish. Plate colourless in 30 minutes, print (*h*) after 20 minutes.

Fig. 3.—Five plates were placed in a 15 by 12 dish, with water at 81 litres per hour falling on centre of short side, the times of washing indicated in figure.

Fig. 2.—Circulating device delivering 116 litres per hour into corner of short side of a 15 by 12 dish. Plates washed clear as indicated.

Fig. 4.—Ditto, device situated on centre of short side.

(Experiments shown in Plate 2.)

Fig. 1.—Water at 81 litres per hour falling into catchment trough of continuous siphon tank. Tank held six plates, of which D_1 and D_6 were inner members, whilst the emulsion of D_2 was exposed to the open water next to the siphon. Prints (*j*), (*k*), and (*l*) were made after 28 minutes, and (*m*) and (*n*) after 42 minutes. All were colourless in 60 minutes.

Fig. 2.—Intermittent siphon tank. This device yielded prints similar to the above, the grading being a little more pronounced.

Fig. 3.—River washing device. The working of this apparatus is sufficiently indicated by the diagrams. Water was admitted at the top end at 81 litres per hour, and flowed from A to B in a thin uniform stream with a velocity of 3 cm. per second. As these conditions could be reproduced with accuracy, they were adopted for standard comparison purposes, strips 1 in. by 3¼ in. of all plates used being dyed and washed thus. The ratio of the time of washing of the strips to a standard time of 30 minutes was used as a factor to adjust the slight differences between one plate and another.

The relative washing power of most of the devices differed so widely from their water-changing constants that it would seem

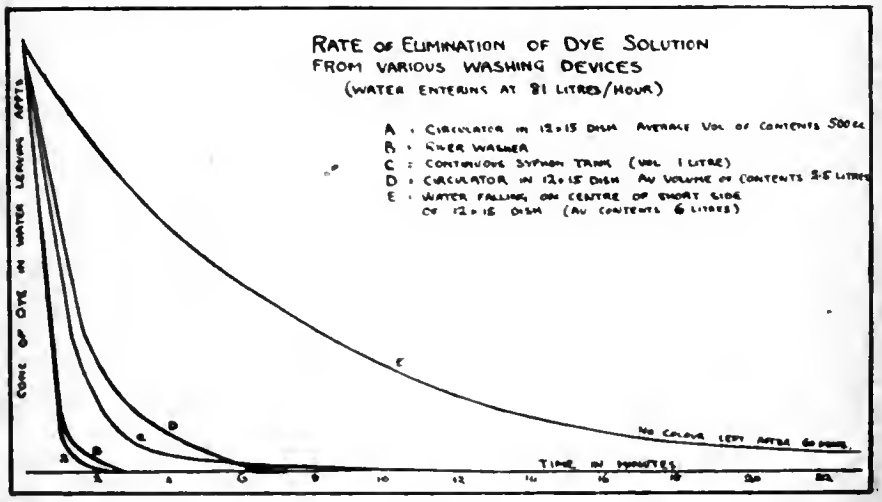


Plate 3.

that the mere quantity of water presented to the plate bore little relation to the time of washing. Thus, plates washed as in Fig. 3, Plate 5, where the conditions are of the worst, cleared in approximately the same time as those treated as in Figs. 1 and 2, Plate 2, though in the latter case complete change was presented to the plate every ten minutes. The most rapid washing took place under conditions illustrated in Figs. 2 and 4, Plate 5, although the incoming water is contaminated with stale solution before meeting the plate.

These anomalies can be accounted for on the assumption that conditions of flow past the actual plate surface are of paramount importance. The mere changing of water, unless this water is driven into intimate contact with the plate, would seem to have little effect. In support of this view, tartrazine-dyed plates were soaked in successive changes of water (*a*) in a mechanically rocked dish, (*b*) the same dish stationary. Five minutes was allowed for each soaking, complete draining taking place between the changes. (*a*) Washed clear in 25 to 30 minutes, while (*b*) was abandoned after 17 changes of water (85 minutes). Comparison between plates (*a*) and plates treated as in Fig. 4, Plate 5, revealed little difference. Yet in the case of (*a*) for the greater portion of each five minutes dye has been diffusing out into wash water in which partial equilibrium is already established. Mechanical agitation of the wash water is thus of supreme importance. Two experiments with the river washer confirmed this. A tartrazine plate was cut into two: one half was placed in the washer when the latter was working normally, *i.e.* with 81 litres per hour, stream velocity 3 cm. per second, and washed clear in 30 minutes. The washer was then tilted so that the stream thinned and accelerated to 12 cm. per second, the volume delivered remaining constant. In this case the plate washed clear in 25 minutes. The stream depths were 0·4 cm. and 0.1 cm. respectively, 0.1 cm. being the thinnest film which would cover the plate. The water used was large in comparison with the gelatine film, so that the dye had the opportunity in each case of diffusing into water of approxi-

2. Cassella. Pure crystalline. Commercial powder was unsuitable.

mately zero contamination. The divergence in washing times suggests an adherent layer of ejected molecules, thin in comparison with the stream used, and which requires vigorous agitation to remove (Fig. 5, Plate 6). Bearing this in mind, a multitude of water jets

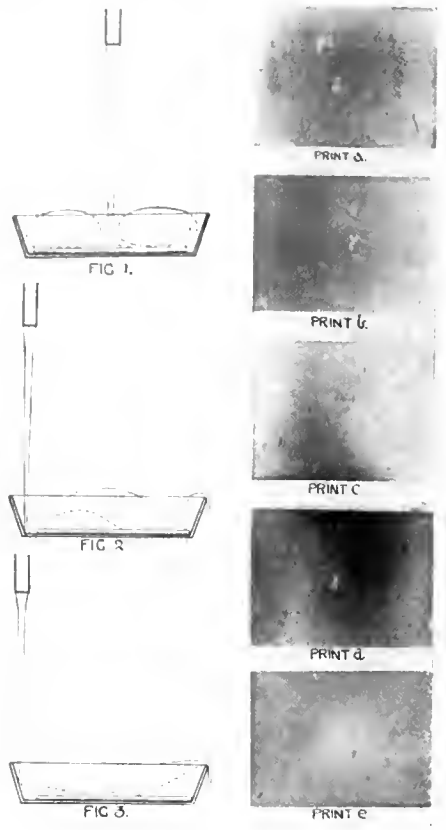


Plate 4.

from a perforated plate was allowed to impinge on to a dyed plate with as great a velocity as the latter would stand (Fig. 7, Plate 6). The concentration of dye in the wash water was literally zero, and any surface film was instantly dispersed. The time of clearance was shortened to 20 minutes. (This device was used in Experiment 2.)

K. C. D. Hickman, B.Sc.
D. A. Spencer, A.R.C.Sc.

(To be continued.)

Photo-Mechanical Notes.

Rotary Intaglio Printing Machine without Doctor.

A recent patent specification, No. 180,218, of 1921, by T. Ruddiman Johnston, of 13, Mikawadai-machi, Azabu-Ku, Tokyo, Japan, describe a machine for rotary intaglio printing, in which the sharp "doctor" blade is replaced by a thick cleaning bar. It is claimed by the patentee that the invention will make it possible to run rotary intaglio printing machines at a higher speed, and yet produce as good a quality of work, and much time will be saved by having an ink remover that does not require to be sharpened.

Fig. 1 is a side, and fig. 2 an end elevation of the improved ink remover and its parts, and fig. 3 is a side elevation of the piece employed to remove the surplus ink.

a^1 is a printing cylinder carrying either an iron sleeve with an etched copper surface, or an etched copper plate as described in Patent No. 117,888 of 1918 ("B.J.," 1918, September 27, p. 439). b^1 is the inking roller running in the ink trough b^2. c^1 is a shaft supported at both sides by the pillars c^2. On this shaft, and opposite the etched plate, is secured the carrier c^3, into which is inserted the piece of metal c^4 which removes the surplus ink. On the ends of the shaft c^1 are placed the pieces c^5, the sockets c^6 projecting from which carry the rods c^7, and sliding on these rods and capable of being secured at any part of them are the weights c^8. By moving the weights along the rods the ink remover can be forced with any pressure desired against the face of the cylinder or plate.

As a short reciprocating movement is given to the shaft c^1, and consequently the ink remover c^4, the pieces c^5 carry feathers which slide in grooves in the shaft, so that the latter may pass through

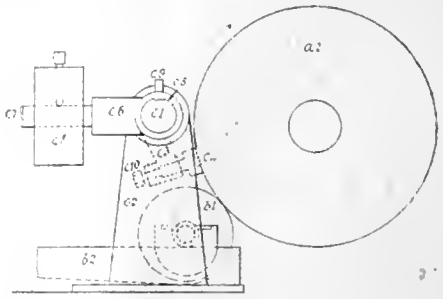


Fig. 1.

them without interfering with the action of the weights, these pieces being retained in position by the small parts c^9, which are secured to the pillars, and have their ends projecting over the raised parts of those pieces.

c^{10} are screws which pass through the carrier c^3 and bear against the ink remover to adjust the latter should this be found necessary.

When an etched copper-deposited sleeve or an etched plate has been printed from, and another has to take its place on the cylinder, the ink trough b^2, with the inking roller b^1 is pulled back, and the weights c^8 having been removed from the rods c^7, the carrier c^3 of the ink remover can be turned away from the cylinder's surface.

The part which removes the ink is made of an anti-friction or other metal that can be cast or ground to exactly fit the printing cylinder's surface, the invention being in using in rotary intaglio printing machines of a blunt, rigid surface resting accurately against the cylinder's face for removing the surplus ink, instead of employing the thin sharp flexible blades now in general use.

As it is possible that a small particle of a gritty nature may occasionally be carried by the ink beneath the ink remover, and scratch its surface, fine parallel grooves are made in the working face of the latter, so that such particles, should they pass its first raised portion, will lodge in the groove and do no further injury, but several grooves are shown to make certain that any such particles will not injure the entire face of the ink remover.

The printing cylinder may occupy any position relative to that of the impression or paper-carrying cylinder, and the ink remover

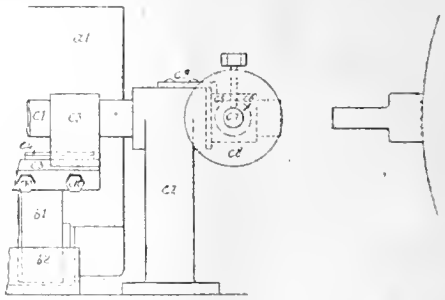


Fig. 2.

Fig. 3.

may be supported either as shown, or directly from the side frames of the machine, the invention being confined to using a blunt metal bar for removing the surplus ink, and not including anything else connected with intaglio printing.

The patentee's attention having been called to a patent No. 3,918 of 1873 (Monkhouse), as bearing to a certain extent on the invention, as this specification cannot be seen in Japan, anyone interested will require to consult it, especially lines 12-18 of page 5.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, June 12 to 17 :—

PHOTOGRAPHY.—No. 16,321. Photography. E. J. Clifford.

MOUNTING.—No. 16,608. Mounting photographs. A. F. Dufton.

COPYING.—No. 16,788. Process for photographically copying line drawings, letterpress, etc. E. Loening & Mimosa Akt.-Ges.

COLOUR PHOTOGRAPHY.—No. 16,242. Colour photography. F. B. Dehn (Pyrocolour Corporation).

TELEGRAPHIC TRANSMISSION.—No. 16,530. Method of transmitting pictures by telegraphy. R. S. Clay.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

STEREO-CINEMATOGRAPHY.—No. 178,344 (January 27, 1921). Two cinema cameras of single objective type are hinged or pivoted together, their mechanism arranged to work in synchronism, and provided with a racking device for readily and accurately controlling the inclination of the cameras, so that in varying their inclination they may be set with their central axes converging on to one and the same point at any desired distance from the camera apparatus. A calibrated scale is provided which indicates the distances from the camera at which the converging central axes intersect one another.

When the apparatus is used with the central axes parallel or so slightly converging that they do not intersect in front of the nearest object photographed, the negative pictures may be masked by means of masking plates inserted in the film gates of each camera in such a manner that the centres of the apertures in the masking plates are at variance with the longitudinal centres of the films respectively, so that a portion of the view is restricted on the left-hand side of the one picture and on the right-hand side of the next following picture, as described for double projectors in Patent No. 177,916, and for stereograms in Patent No. 9736/13.

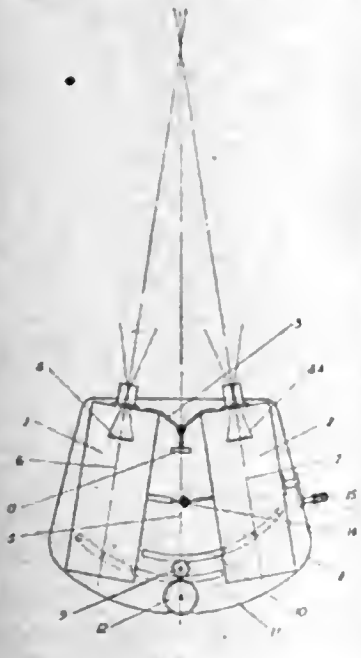


Fig. 1.

In fig. 1, 3 represents the hinge with wide flanges and the knuckle turned slightly back from the front of the cameras, so that, by increasing the inclination of the cameras 1 and 2 the separation of the objectives is reduced.

The two cameras 1 and 2 are mounted on a common base board 4 and the knuckle pin of the hinge 3 is continued into the base board and is fixed thereto. The hinge 3 is of the type known as loose butt, so that the hinged cameras may be removed from the knuckle pin; 5 represents the centre line of the apparatus which is consistently the bisecting line of the angle of convergence; 6 and 7 represent the central axes of the objectives for the two cameras coinciding respectively with the longitudinal centre of the vertically progressing picture films 8 and 8^A and perpendicular thereto.

A pinion 9 and twin racks 10 and 11 comprise a device for inclining the cameras simultaneously in relation to the centre line 5. The outer rack 11 of the racking device, also operates an indicator dial 12, on the circumference of which appears a scale indicating the distances from the camera apparatus at which the converging central axes 6 and 7 intersect one another on the centre line 5 when the inclination of the cameras is varied by means of the racking device. The pinion 9 is terminated in an operating knob beneath the base board 4. The base board 4 is supported and pivoted on a substantially constructed tripod, so that the apparatus may be rotated.

At the top of the hinge knuckle pin is fixed a view finder 13 of known type, set in alignment with the centre line 5. The driving spindles of the two cameras are connected together by means of a suitable universal joint 14, so that their mechanisms are driven in synchronism from one operating handle 15.

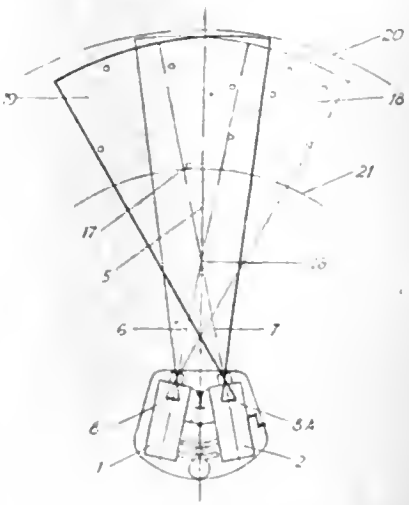


Fig. 2.

The cameras 1 and 2 are inclined towards one another, as shown in fig. 2, until their central axes 6 and 7 intersect at a point 16, on the centre line of the apparatus, in this case, nearer to the camera apparatus than the nearest object 17 in the photographic field of view. Thus the left eye picture 8 will embody images rightward 18 which do not appear in the right eye picture 8^A. Similarly, the right eye picture 8^A will embody images leftward 19 which do not appear in the left eye picture 8.

The arcs 20 and 21 represent the approximate depth of the photographic view.

The method of arranging the sequence of the exposures and dealing with the negative picture films in the production of the positive picture film is that in which the pair of negative films are produced with the exposures following one another without interspaces. The positive picture film is then made from the two negative films by leaving unexposed interspaces when printing from the one negative film and by exposing upon these interspaces when printing from the other negative film.—Sidney Hockley, 51, Dora Road, Wimbledon Park, London, S.W.19, and Archibald Slater Wilmot, 41, Tofnell Park Road, Tufnell Park, London, N.7.

DEVELOPERS.—No. 154,193 (October 23, 1918). In the course of experiments to determine the influence of substituents in the nucleus in the known amido-phenol or amido-cresol developers in respect of their developing properties, the patentees have discovered that the accession of the carboxyl group completely nullifies the developing capacity of the basic substances so long as the operations are carried out with sodium sulphite and sodium carbonate or potassium carbonate. By dissolving the developer in water and adding potassium carbonate, the carboxyl groups are certainly converted into their alkaline salts, but this procedure does not result in the production of a developing solution. In order to restore to solutions containing carboxyls their original developing properties, the hydroxyl-groups are, according to the invention, more or less completely converted into their alkaline salts by the application of free caustic alkali. Only by this means are the developing properties, which the presence of the carboxyl-groups had nullified again restored; but they are then re-established in a different character, and at the same time, in an enhanced degree of effectiveness. If only a part—say 25 per cent.—of the hydroxyl-groups present be neutralised with free

alkali, a slow acting developer is produced; whilst, if, say 50 per cent. of the hydroxyl groups present be neutralised, the developer produced is normal in its action. The complete neutralisation of the hydroxyl groups serves, however, to impart to the developer the characteristic of rapid action. Broadly speaking, the carboxyl group forms, as it were, a means of predetermining and regulating the developing properties of the solution as regards speed of action.

Moreover, seeing that other favourable qualities, from the point of view of technical photography, are obtained, the accession of the hydroxyl groups affords valuable advantages and constitutes a great advance in relation to the developers hitherto employed. Particularly is this the case as regards the power of the improved developers to compensate for the most diverse defects of exposure, more particularly for highly excessive exposure, which may be allowed to be 100 times the normal. The improved developers show no tendency to fogging effects; nor even to the yellow stain hitherto invariably resulting from prolonged development. According to the degree of dilution of the developing solution, the silver deposit exhibits a colour varying from black to brown, a specially valuable property for transparencies or photographs taken on gas-light papers. The developers do not stain the hands, and possess all the advantages and none of the disadvantages of the popular pyro developers.

The following examples are taken from the amidosalicylic-acids treated with hydrochloric acid :—

A stock solution of amidosalicylic acid of a two- or three-fold degree of concentration may be prepared in the following proportions :—

Amidosalicylic-acid	100 gms.
Sodium sulphite, free from water	500 gms.
Caustic lye of 5-times normal strength (200 gms. pure caustic soda per litre)	210 ccs.
Water	4,790 ccs.

Five litres of a stock solution (S), which may be preserved indefinitely, is thus produced. For developing purposes this solution is diluted with an equal or a double volume of water and then reacted on, according to requirements with the following proportions of ordinary soda lye :

Solution 1.—For over-exposure or for slow action; solution S. 50 ccs.; water 50 ccs.: normal caustic soda 3 ccs.

Solution 2.—For normal exposure and quicker action; S. 50 ccs. water 50 ccs. normal caustic soda 5 ccs.

Solution 3.—For normal exposure and rapid action; S. 50 ccs. water 50 ccs. normal caustic soda 7 ccs.

Solution 4.—For under-exposure and rapid action; S. 50 ccs. water 50 ccs. normal caustic soda 8 ccs.

Solution 5.—For enlargements; with normal action; S. 50 ccs. water 50 ccs. normal caustic soda 10 ccs.

Solution 6.—For enlargements, with quick action; S. 50 ccs. water 50 ccs. normal caustic soda 12 ccs

According to requirements, these proportions may be still further varied for special purposes. If the solution (S) be, for example, more strongly diluted the result is a slower development with brown tones. From gradual neutralisation, after repeated developing, the lye becomes exhausted of its reactive properties and must therefore be restored by addition from time to time so that the developing solution may recover its original efficacy.—J. Hauff & Co., 333, Stuttgarter Strasse, Feuerbach, near Stuttgart, Germany.

[Reference is directed by the Patent Office to Specification No. 1,736 of 1891, viz., that of the Actien Gesellschaft für Anilin Fabrikation, by which the latter firm's "Rodinal" developer was protected. From this reference it is to be assumed that in the view of the Patent Office the present invention of J. Hauff & Co. is wholly or partly anticipated by that described in the cited specification.]

Light-Sensitive Viscose Materials.—No. 178,942 (January 26, 1921.)—The invention relates to a process for the production of sensitive transparent viscose (cellulose) films for photographic purposes.

In order to sensitise, for photographic purposes, transparent films which do not resist water, especially certain cellulosic films for example cellulosic films obtained by recovering cellulose from an aqueous solution of sodium cellulo-xanthate) an aqueous solution has heretofore been used as a preliminary bath with the object of causing the film to swell, and of enabling the sensitising substances to penetrate into the interior of the film.

The object of the invention is a process based on the treatment of the viscose in a preliminary bath of an aqueous solution of one of the salts required for the treatment.

In order to produce a bromide film two baths are used; one of silver nitrate, and the other of potassium bromide. To produce sensitive silver bromide within the interior of the cellulosic film in an absolutely satisfactory manner under these conditions, it is necessary that the concentration of the precipitating bath should be molecularly equal to, or higher than the concentration of the solution which impregnates the film after leaving the first bath. Proceeding in this manner, and taking care to drain off the excess of the first bath, a deposit is obtained which is entirely in the interior of the film, and which does not diffuse in the precipitating bath, the latter remaining limpid; whilst the film retains a glossy and homogeneous aspect; results which could not be attained if the second bath were more dilute than that described above.

For example, if the dry film be impregnated with a solution of silver nitrate containing 10 gms. per 100 ccs., the potassium bromide bath employed for producing the silver bromide should contain in 100 ccs : $10 \times \frac{119}{170} = 7$ gms., at least, of potassium bromide the molecular weight of which is 119, that of silver nitrate being 170. On the other hand, if the first bath consists of an aqueous solution of potassium bromide containing 7 gms. per 100 ccs., the second precipitating bath of silver nitrate should contain at least 10 gms. of silver nitrate per 100 ccs.

By varying time of exposure, dilution of the developer, time of development and the like, cellulosic films which have been sensitised by pure or mixed silver halogen salts of very fine grain, will give a range of results as regards warm and cold tones, provided the films which do not resist water have a very fine grain obtained without ripening or by only carrying the ripening to a certain stage.

In other cases the sensitiveness thus obtained is not sufficient. It is, therefore, necessary to use a ripening process.

If the cellulose impregnated with silver nitrate in a cold aqueous solution is immersed for merely a few seconds in a weak solution of potassium bromide, a silver bromide of very fine grain is obtained which constitutes an unripened salt which is insufficiently sensitive. The sensibility of these silver cellulo salts is increased :—

By using—other conditions of time and temperature being equal—more concentrated solutions of either the silver salts or halogen salts or both;

By carrying out the operation at higher temperatures:

By prolonging the time of the action of the precipitating bath either in the cold or in the warm, acting in this case either on a large quantity of the bath, or simply on the small quantity retained by the cellulose by simple impregnation:

By impregnating the cellulo-salt already formed with a solvent of the cellulo-salt, and by taking precautions in this case to presaturate this solvent with the same silver salt with the object of preventing the salt formed in the cellulose from being dissolved;

By adding a suitable ripening agent, such as iodised silver nitrate or ammonia to one or to both baths;

By combining the halogenated salts in suitable proportions so as to produce for example an iodo-bromide of silver.—Jaques Edwin Brandenburger, 16, Rue du Louvre, Paris.

FORTHCOMING EXHIBITIONS.

August 26 to September 9.—Toronto Camera Club. Latest date for entries, July 22. Secretary, J. H. Mackay, Toronto Camera Club, 2, Gould Street, Toronto, Canada.

September 9 to October 7.—London Salon of Photography. Latest date for entries, August 30. Particulars from the Hon. Secretary, London Salon of Photography, 5a, Pall Mall East, London, S.W.1.

September 11 to 15.—Professional Photographers' Association, Princes Galleries, Piccadilly, London, W. (Trade and Professional). Hon. Secretary, Richard N. Speaight, 157, New Bond Street, London, W.1. Also foreign invitation loan exhibition

of professional portraiture. Hon. Secretary, Marcus Adams, 43, Dover Street, London, W.1. Latest day for entries and exhibits, August 31.

September 18 to October 28.—Royal Photographic Society Annual Exhibition. Latest date for Entries, August 25 (carrier); August 26 (hand). Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SUNDAY, JULY 2.

Hammersmith Hampshire House P.S. Outing to High Wycombe.

MONDAY, JULY 3.

Southampton C.C. Display of Home-made Apparatus.

TUESDAY, JULY 4.

Bournemouth Camera Club. Question Night.
Manchester Amateur P.S. "Portraiture." T. Longworth Cooper.

WEDNESDAY, JULY 5.

Rochdale Amateur P.S. "Weeding and Pruning." A. F. Barnes.

THURSDAY, JULY 6.

Hammersmith Hampshire House P.S. "Retouching the Negative." Stuart Taylor.

SATURDAY, JULY 8.

Bournemouth C.C. Outing—Blandford and Stour Valley.
City of London and Cripplegate P.S. Outing to Rickmansworth.
Partick Camera Club. Outing to Castlemilk.
Willesden Phot. Soc. Outing to Watford.

CROYDON CAMERA CLUB.

Mr. B. J. Rose on "Home-made Toys" filled last week's informal meeting. As with other photographic societies, Croydon possesses a floating rank and file out of which, from time to time, personalities are revealed in temperament, thought, and pursuits. Mr. Rose has long since so emerged.

Cheerful optimistic views are held by him on life in general, officialdom excepted, and he is especially strong on the home, and in particular the right way to deal with domestic servants, which includes many valuable recipes for converting the trial and tribulation variety into blessings of the seldom-met-with order. His special photographic bent is pinhole photography. Fond of debate, he has a delightful way of earnestly entreating the other side to take a common sense view of things, which invariably coincides with his own opinions.

Mechanically, he is a marvel in producing elegance from the dust-bin, so to speak, and the various ingenious toys passed round, constructed out of odds and ends, should make him a prime favourite with our little people. Of such stuff is parental greatness made.

Commercial & Legal Intelligence.

LEGAL NOTICES.—Notice is given, pursuant to Section 242 (5) of the Companies (Consolidation) Act, 1908, that the names of the Arcade Studios, Ltd., and the Portsmouth Photo Co., Ltd., have been struck off the Register of Joint Stock Companies, and the companies are dissolved.

A PHOTOGRAPHER'S VARIED CAREER.—At the London Bankruptcy Court last week, the public examination was held of Henry Spencer, of 179, Archway Road, Highgate, photographer. The statement of affairs showed unsecured liabilities amounting to £3,287 8s. 2d., and assets consisting of shares in Spencer Enterprises, Ltd., which the debtor considered were of no value, thus showing a deficiency of £3,287 8s. 2d.

The Official Receiver's report upon the case was to the following effect:—

The debtor for about twenty-two years prior to 1896 resided on the Continent and dealt in horses, building material, etc. He also drove a cab in Paris, was a photographer, and, for about twelve months, the proprietor and editor of a paper published in Paris. For two years from 1896, he was employed as a canvasser and collector in the photographic business in Wales. He then opened a studio in Barry, and carried it on for about four years. He then returned to the Continent for two or three years and dealt in ships' stores, etc., in Antwerp. In 1899, he, in partnership with another person, opened a photographic studio in Northampton, but left that business in 1900 and came to London, where he carried on a similar business for about two years in Ball's Pond Road, N. For about eighteen months from 1902 he was in the employment of a firm of photographers, managing a branch in Chatham, where photographs were sold on a weekly payment system. In about 1903 he opened offices in Birmingham, where he commenced a similar business. In August, 1904, he formed "The Midland Counties Photo. Co., Ltd." to take over his business, and he became managing director of the company, which traded until 1905, when it went into liquidation. In 1905, he opened a photographic studio in Princes Street, Edinburgh, and carried it on for about twelve months, when he sold it. In 1906, he opened a similar business in Dundee, where he carried it on for about twelve months. In 1907 he commenced business in Glasgow as a business agent. He also conducted a photographic studio there, and an agency for the sale of tea. Judgments were obtained against him and he left Glasgow. In 1909, he, in partnership with another person, opened a photographic studio in Hanwell, but six months later he sold his interest to his partner. Thereafter, until September, 1911, he travelled about the country taking photographs, and during that period he lived at Wolvertou. He then became debt collector for a dentist, and in January, 1912, opened and was manager of a branch dental surgery at Croydon. In January, 1913, he opened and managed another branch at Bridgwater, which was afterwards taken over by a company in which he had 100 £1 shares, and which he continued to manage until September, 1914. He then commenced a photograph enlargement business by canvassing from New Southgate, but left there at the end of 1915. From about Christmas, 1915, he was in the employ of dentists in Kettering as outside organiser and collector until September, 1916. He was employed until early in 1917, when he obtained similar employment with a dentist in Hammersmith, with whom he remained until early in 1920. For about three months, early in 1920, he, in partnership with another person, carried on business as house agents at 36, Bridge Street, Hammersmith, under the style of "Martin's Agency." In about June, 1920, he commenced business under the style of "The Spencer Picture-Framing and Portrait Enlarging Co.," at No. 57, Kensal Road, Westbourne Park, W. In October, 1920, he moved to No. 179, Archway Road, Highgate, N., where he continued the business until it was taken over by "Spencer Enterprises Ltd.," in January, 1921. He and his wife were the only directors of the company, until an order was made for its compulsory winding-up on April 11, 1922. For a short period he also dealt in gramophones, under the style of the Porta-Gramophone Co.

In response to advertisements for "managers," various persons paid him sums of £200 or £250, and were appointed by him managers of branch photographic businesses opened at different places throughout the country. On March 28, 1922, he registered the London and Continental Enterprises, Ltd., of which he and his wife were directors, to make enlargements of photographs, etc., and to carry on business at No. 179, Archway Road, Highgate, N.

He attributed his insolvency to difficulty in securing suitable premises and having to pay the salaries of "managers" without premises for them to manage, to general unemployment and slackness of trade, to liability in respect of cash provided by managers and to ill health. The following deficiency account, dating September 1, 1920, has been filed:—

	£ s. d.
Liabilities assumed by Spencer Enterprises, Ltd., for which he is also held responsible	3,266 13 2
Household and personal expenses	370 15 0
	£3,637 8 2
Deduct:—	
Net profit from September 1, 1920, to January 11, 1921, when the company took over the business, £150	
Remuneration as managing director of Spencer Enterprises, Ltd., £200	350 0 0
Deficiency as per statement of affairs	£3,287 8 2

Of the unsecured liabilities, £2,849 15s. 2d., represented cash provided by managers, plus arrears of salary, interest, etc., £221

10s. 5d., rent, gas, electric light, etc., £120 cash advanced, £44 3s. 7d., goods supplied and work done, £31 4s. taxes and £20 15s. personal debts.

The "contingent liability" is in respect of a guarantee given on behalf of his wife who carried on business as a photograph enlarger, at 57, Kensal Road, Westbourne Park, W.

The debtor stated that the household furniture belonged to his wife.

The examination was closed.

NEW COMPANIES.

Howcrofts, Ltd.—This private company was registered on June 16, with a capital of £500 in £1 shares. Objects: To acquire the business of Florence Howcroft at 74, Blackburn Road, Bolton, and to carry on the business of dealers in photographic goods, etc. The first directors are: Frank Howcroft, 74, Blackburn Road, Bolton; Mrs. Florence Howcroft, 74, Blackburn Road, Bolton; and N. Hulme, 314, Blackburn Road, Bolton. Qualification: 1 share. Secretary: F. Howcroft. Registered office: 74, Blackburn Road, Bolton.

News and Notes.

Dallmeyer Lenses.—Messrs. J. H. Dallmeyer, Ltd., have received information from Mr. Hinks, Secretary of the Royal Geographic Society, that the two photographs of Mount Everest taken by members of the Mount Everest Expedition, which appeared in the "Daily Mail" dated the 19th inst., were taken with telephoto lenses of their manufacture. The cinematograph cameras taken out by the expedition early this year were fitted with Dallon telephoto lenses.

Photography at the R.A.F. Pageant.—One of the most interesting of the events at the Royal Air Force Pageant, held at Hendon last Saturday, was a photographic competition, in which the pilot had to take an aerial photograph of certain landmarks in the vicinity of the flying ground, the winner being the pilot who got his objective nearest the centre of the negative. Six different air stations took part in this competition, and negatives were developed in a mobile R.A.F. lorry, prints taken off them, and sold to the public on the ground.

Deciphering Burned Records.—Records charred beyond recognition in a fire at Augusta, Ga., have been made legible by the Bureau of Standards. Chemical means failed, so Raymond Davis, chief of the photographic laboratory, laid the charred sheet between two photographic plates with the emulsion side next the paper. After two weeks of contact, the developed plates gave a plainly readable record. Where there was contact between the charred paper and the plate, the latter was affected, but where the ink had been the chemicals of the plate were unchanged.—"Scientific American."

Quick Press Photography Again.—The London afternoon newspapers of 21st inst. contained excellent reproductions of photographs taken during the same morning at Plymouth on the occasion of the return of the Prince of Wales on board the *Renown*. The photographs were taken at about 10 o'clock, dispatched from Plymouth by aeroplane at 10.35, and reached Hendon at 12.35—220 miles in two hours. The plates were delivered by motor-car to the Central News at their office in New Bridge Street at 12.55, and at 1.30 this firm supplied a newspaper office with finished prints, and newspapers containing half-tone reproductions were very soon on sale.

Photographic Portraits for Election Purposes.—"Modern Electioneering Practice" is the title of a new thirty-five shilling book published last week. One of the writers is Mr. H. J. Houston, who is well qualified to write on such a subject, he having won elections in the face of fearful odds. Of photography he says:—"A great deal of care should be taken to make the portrait poster as effective as possible. If there is not a thoroughly reliable lithographic or photogravure printer in the division the work should be sent to London. No third-rate work should be tolerated at the expense of the candidate's features—not to speak of his chances with the women voters."

From Typing to Photography.—Changing jobs late in life was the subject taken up by the "Daily Chronicle" last week. The experienceof a short-hand typist is given in a letter:—

"Perhaps it may interest you to know that after 30 years as a shorthand-typist I have become a photographer. As a girl I was not able to get the training I wanted, but facilities for women who wish to take up photography are much greater to-day, and I found that after all the experience I had as an amateur photographer it was not difficult for me to learn enough to take up this fascinating art professionally. My age was a little against me at the outset, but once I was able to prove that I could take really good and distinctive pictures I was able to get employment, and I hope soon to set up my own studio."

Assistants and the P.P.A. Congress.—The Congress Council have set aside the Thursday evening in Congress week, September 14, as an assistants' evening, at which all photographers' assistants are invited to view the trade and photographic exhibitions. Music and refreshments will be provided and suitable interesting subjects discussed. The Council offer awards to assistants for the best window or show-case display of photographs, such displays to be arranged by the assistants competing, the size of photograph to be 12 x 10 in. unmounted, flat (not rolled). The competition will be judged at the Annual Congress, Princes' Galleries, Piccadilly, W.1, and all photographs submitted will be exhibited during that week. Photographs of windows or show-cases to be sent to the Secretary, Alfred Ellis, 2, Vinery Villas, London, N.W.8, marked "Assistants," not later than Thursday, August 31, 1922. All photographs must bear competitor's full name and address and the name and address of employers. Full details of the Assistants' Evening will be published later when the arrangements are completed.

Imported Picture Mouldings.—In the House of Commons on June 19 Mr. Galbraith asked the President of the Board of Trade whether he has received an application to impose a duty on imported picture mouldings; and, if so, in view of the uncertainty that exists in the picture and photograph frame trade, will he make an early announcement on this matter?

Replying, Mr. Baldwin said he thought it undesirable to give information regarding the nature or scope of any particular complaint unless it was referred to a Committee.

Mr. Kiley: "Does not the right hon. gentleman realise that when an announcement is made in a trade paper about application being made to impose a duty, it creates a certain amount of unrest and concern in that trade? Why cannot he make an announcement when he comes to a decision?"

Mr. Baldwin: "I do not agree with the hon. member. A great many announcements appear and are taken for what they are worth."

Mr. Kiley: "Did the right hon. gentleman not make a reference to the imposition of a duty on a certain article and to the import of that article, showing the results of such an announcement?"

Mr. Hogge: "Does my right hon. friend's answer apply to Government announcements?"

Mr. Baldwin: "I think the remark was of general application."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspnodents.*

COPPER TONING.

To the Editors.

Gentlemen,—The use of oxalates in the Ferguson copper toning process is not new, but is described by me in my paper of twenty-two years ago (Phot. Jour., xxiv., 135, 1900).

I found, however, that unless the water used was free from lime, and most town's water is not, a precipitate of oxalate of lime and cupric ferrocyanide was formed on and in the fibres of the paper, thus staining the whites. Some of this could be reduced by rubbing, and the rest cleared with hydrochloric acid, but that meant more washing and a tendering of the film.

The solution also if made with London tap water would not keep. Though clear at first it became muddy, and deposited in turn neutral oxalate of copper, and crystalline needles of potass caprie oxalate and oxalate of lime, and unless the toning were done at once and the dish well rocked these particles marked the film. The toning time taken was long; one hour for red tones.

All ammonia-copper compounds tried were found to stain the paper base, due probably to the action of the cuprammonium on the cellulose.

For the above reasons, I finally adopted the neutral potassium citrate as a solvent, which was perfectly satisfactory, and the mixture is now used—I believe literally in tons—for the toning of cinematograph films with the greatest success.

W. B. Ferguson.

BLUE SCREENS IN COPYING STAINED PRINTS.

To the Editors.

Gentlemen,—In reply to Mr. Venning's letter in your issue of the 23rd inst., may I state that my letter was based upon the experience of thousands of exposures upon wet collodion, ordinary, ortho and panchromatic plates, with screens ranging from almost colourless quinine sulphate solutions to powerful microscopic contrast filters.

Out of these exposures only a score or so have seemed to repudiate theory, but upon investigation these exceptions have in every case proved to be the result of some disturbing factor or circumstance not previously noticed. For instance, in one case a red screen (panchromatic plate) emphasised the apparently orange-coloured spots on a print. While seeking the reason for this unexpected result, I noticed that, viewed at certain angles, they had a decided green cast. A change to a green screen practically eliminated them. Possibly this bears some analogy to the instance of Mr. Venning.

I read his letter very carefully before writing, and did not suggest that the experimenting was an initial attempt at photography, but referred only to his colour work. As he neither described any details of the "nature of the stain" or characteristics which influenced his "choice of screen," I do not see why I should have been particularly impressed by them.

The inclusion of the yellow freckled client (I take it the word "cloud" in Mr. Venning's letter is a printer's error) cannot be objected to, as freckles in portraiture would equally conform to the same manipulations as spots in copying, which are really yellow, and not of the dichroic type referred to above, and commonly met with.—Yours faithfully,

J. F. Milner.

Bumberstone Road, Leicester.
June 26.

PHOTOGRAPHIC BUSINESS IN JAPAN.

To the Editors.

Gentlemen,—Since 1919 a steady increase in imports of British photographic apparatus and material has taken place, until to-day the public has a greater range of British goods to choose from than those from any other country. It is interesting to note, however, that during the past twelve months the Germans are once more securing a strong foothold with their cameras and lenses, due principally to the depreciation of their currency, enabling them to offer cheaper prices, and to the partiality of the Japanese consumer for German goods, brought about by the very efficient propaganda work employed by the Germans in pre-war days. Once more they are using the same tactics, and seemingly go to no end of expense in persuading the consumer that German goods "are the best." As an instance, there are several very attractive stands at the Tokio Peace Exhibition, displaying the wares of the leading German photographic manufacturers, whereas not a single British manufacturer is represented, except through having his goods displayed in the stands held by the leading wholesalers of the country.

The prosperity which Japan has enjoyed during the past few years has resulted in an enormous increase of both amateur and professional photography, and there is every indication that this interest has come to stay. Many one-time amateurs, imbued with the idea to "get rich quick," started up as photographic dealers, and as every merchant, however small, likes to be known as a "direct importer," it was soon found that the British merchants gave the best terms of payment.

American photographic manufacturers always demand payment by confirmed banker's credit; German manufacturers appoint German firms, established in this country, as agents, who in turn sell C.O.D., or sometimes on a P/N basis to approved Japanese wholesalers only, whilst many British manufacturers, believing the people they are dealing with to be as honest as themselves, very often finance by documents on acceptance.

Now, the above-mentioned "get-rich-quick" merchants are in the habit of using elaborate letter-heading for their foreign correspondence, and their letters, as a rule, are written in a fairly business-like manner, so that the receiver is often deluded into believing that it comes from a responsible source. At times, also, the sender will refer the addressee to one or other of the leading Japanese banks, who, if they are ever approached, will give a non-committal reply, but worded in such a way that one is led to believe the firm being inquired about is a perfectly responsible one. At first, more or less small orders are forwarded to the British firms, and on arrival of the goods the drafts are accepted and paid for, which gives further confidence to the shipper. Then our small merchant, who perhaps has been successful in selling his first two or three shipments at a profit, and has also obtained the confidence of the British shipper, forwards a much bigger order, stipulating it is to be financed D/A. Some do this with a mistaken idea of their ability as business men, whilst others do it with the deliberate intention of cheating the shipper. In either case, the effect on the British shipper is the same, as on presentation of the draft to the drawee, it is at once accepted by him, and the bank hands over the shipping documents, enabling the local merchant to secure control of the goods, and then, when the due date of payment of the draft comes along, the bank is simply informed by the drawee of the draft that, through bad market conditions, bad luck, or any other equally futile excuse, he is unable to meet his obligations. The bank then recovers all expenses incurred from the drawer, and more often than not the whole transaction means a total loss to the latter.

This, however, is only the beginning of the damage to the manufacturer. Once the importer has control of the goods, which have cost him nothing but landing charges and Customs duty, he is able to offer his wares at exceptionally low prices—so low, in fact, that the three or four legitimate wholesalers, who meet their obligations and trade in an honest, straightforward way, find it impossible to compete in price, and so decided to give up importing goods which small retail shops are able to buy direct from the manufacturer. Little or no recourse can be had through the Japanese Law Courts, as Japanese laws seem to have been especially promulgated to help a dishonest merchant to prosper. I am of the opinion that there are not more than four photographic importers in this country upon whom it is safe to finance either documents on payment or documents on acceptance. From all the others, British manufacturers and exporters should stipulate for payment by confirmed banker's credit, preferably the Yokohama Specie Bank's E Form Letter of Credit, or one issued by one of the foreign banks established in Japan.

Forgive me for taking up so much of your valuable space, but it is because I feel the British manufacturers do not realise existing conditions in Japan, that has induced me to place the facts before them, in the hope that they will be prevented from enriching many unscrupulous retail merchants at the expense of themselves, and further antagonising the large wholesalers (who in reality do the great volume of trade) against their wares.—Yours faithfully,

"Britisher."

SOCIETY PREMISES.

To the Editors.

Gentlemen,—I am informed that a number of photographic societies throughout the country have a room, or rooms, placed at their disposal by local municipal councils, either freely or at a preferential tariff. I should be glad if Hon. Secretaries of any such societies would please communicate their arrangements to me. My Committee intend approaching our town council, and such knowledge would be of great service to us.

I am, Gentlemen,
Yours faithfully,

W. T. Comer.

4 and 6, Arcade, Walsall.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

S. S.—Impossible to say from the particulars. If you will send one or two of the defective prints we will see what we can do.

M. F.—Out of print, but no doubt obtainable for a shilling or two from Messrs. Foyle, Charing Cross Road, London, W.C.

X. X. N.—R. H. Bow died on February 17, 1909, at the age of 82. Many of his papers on photographic optics appeared years ago in the "B.J."

PERMUTE.—The booklet on the opportunities for outdoor portrait business, issued by Messrs. Sands, Hunter, Bedford Street, Strand, London, W.C., should give you the suggestion you want.

B. L. M.—Persulphate can be used as the reversing bath for Autochromes, but has no advantage over the usual permanganate formula. If you prefer the permanganate bath before re-use, you will not get spots. In first making up, dissolve the permanganate in very hot water, and add the sulphuric acid when the solution has cooled.

C. D. AND CO.—It is clear from what you tell us that the portrait was made in execution of an order given in the ordinary course, and therefore, as we have said scores of times in this column, the copyright is the property of the sitter. As regards copying it or ordering it to be copied, she can do exactly as she likes. You had better excuse your ignorance of this very elementary fact of copyright law in the best way you can.

T. E.—About the best way to repack plates after exposure is, first, to cut round the original wrapping of box across the middle. In repacking, all that is necessary is to replace the two halves of the cover, when a piece of adhesive paper, such as used for binding lantern slides or passe-partouts, stuck round where the cut was made, will join both cover parts together, and the plates are as secure and safe from injury as when first received from the makers.

K. Y. E.—Bromine solution makes a first-rate bleach in the sulphide toning process, but it is impossible in practice on account of the most irritating vapour which it gives off. Certainly the vapour itself might be used, its bleaching action being followed by the application of sulphuretted hydrogen gas. This pair of substances in solution provides an effective toning process, no washing between bleaching and darkening being necessary, but it would not be easy to work such a process regularly.

E. MENNY.—Ensyna was a silver phosphate paper made under the patents of York Schwartz. Nos. 9,993 of 1908, and 9,855 of 1907. The developer was issued under a patent (No. 13,032 of 1905) of J. H. Mallabar. The full specifications can be seen in the library of the Patent Office, 35, Southampton Buildings, London, W.C. Paget Phosphate and Wisto papers (the latter made by B. J. Edwards) were somewhat similar products. You will find a full account of all three in the 1910 Almanac, pp. 551-555.

P. E. N.—Perhaps the following formula for a dry ready-to-use amidol developer will answer your purpose:—

Soda sulphite anhydrous	30 gms.	1 oz.
Diamidophenol	5 gms.	80 grs.
Soda metabisulphite cryst.	50 gms.	1¾ ozs.
Potass bromide	3 gms.	45 grs.

These substances are pounded together with mortar and pestle until a fine powder is produced, and the mixture is stored in well-closed tubes. The above mixture is dissolved in water, 1,000 c.c.s. or 35 ozs.

F. N. T.—Some years ago the late Mr. Essenhigh Cooke made exactly the same suggestion. He showed the advantage which can be taken of a small pocket camera (the focussing scale of which does not extend beyond about 6 ft.) by using the instrument on a tripod and with the smallest stop in the lens. In this way objects much nearer to the camera than the shortest distance provided by the focussing scale may be satisfactorily copied and distant objects obtained on a larger scale by using the camera at its full extension and stopping down the lens.

A. E.—You certainly cannot photograph the dancers by flash-light when they are in movement, since that would mean an exposure of not more than about a 50th or 100th of a second, and a sufficient charge of flash powder will probably take at least a 20th of a second to burn. For a standing group, with the dancers in anything like the position which they occupy when in movement, you will probably have to stop down the lens to about *f*/11 or *f*/16, under which condition, when using an ultra-rapid plate, probably half an ounce of flash powder (Johnson's "Professional") will not be too much, especially if the building is a large one, so that you do not get much advantage by reflection by the walls.

J. SMITH.—The only thing of the kind which we can trace is a process described in a German patent, No. 201,968, of Tellkampf, in which a ferricyanide bleach is used for the production of a printing surface from which proofs in greasy ink may be taken. The ferricyanide-bleached print is applied to a gelatine film containing a ferrous salt (prepared from a mixture of 100 gms. of gelatine and 1 gm. of ferrous sulphate in 600 c.c.s. of water). The unaltered ferricyanide in the print combines with the ferrous salt, producing an insoluble salt in the gelatine, which, after this treatment, is able to absorb a fatty ink. From the relief film thus obtained, prints are taken off by contact.

H. H.—In almost all seaside resorts the local authority, the Town Council, or the local District Council, sells its rights for photography on the beach for (often) quite considerable sums, and therefore prohibits other persons from carrying on a photographic business on the beach. We think you will find that this is the case in most seaside resorts. In some places the police authorities require a photographer carrying on a while-you-wait business in the streets to have a pedlar's licence. Our correspondence shows that the requirements of the police in this respect differ greatly in different localities, but you may take it as certain that the possession of a pedlar's licence will not help you at all as regards carrying on your business on the beach.

F. D.—It is a considerable disadvantage not to have any side light available, but we think you can make a fair studio by glazing the greater part of the N.E. side of the roof. Have 4 ft. boarded over at C, and then 20 ft. run of glass and 5 ft. boarded over at the other end. This will give a fair amount of high front light. Is such a studio a large cheval glass may be used to give a certain amount of side light, with good effect. We assume that there are no side walls near the studio, which are of greater height than the eaves. There would be no object in having glass on the ends of the studio, except for "fancy" effects. You might put one sash, say 6 ft. square, at the end, and work across the studio sometimes, in which case it would be better to carry the glass right along to the end.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3244. Vol. LXIX. FRIDAY, JULY 7, 1922. Price Fourpence.

Contents.

SUMMARY.

A judgment last week in the Court of Appeal (reversing a previous judgment in the High Court) held that the "equitable assignee" of part of a copyright cannot by himself take action for infringement of the copyright which has been assigned to him in this manner, but requires either to obtain assignment in law before taking action, or, alternatively, to be joined with the legal owner of the copyright as co-plaintiff in any action for infringement. We quote the judgment from the "Times" on page 406, and in a leading article on page 398 refer to circumstances, in connection with copyright in photographs, in which the judgment would apply.

The method of extra-sensitising, worked out by M. F. Monpillard, has been applied by M. Gimpel to ultra-rapid ordinary plates, and has permitted of some shutter exposures of subjects under ordinary artificial illumination. (P. 399.)

In the concluding portion of their paper on the washing of negatives and prints, Messrs. K. C. D. Hickman and D. A. Spencer describe tests of further washing appliances, and also give a description of an ingenious pneumatic rocker for developing dishes. (P. 400.)

The Northern exhibition will be held next year in Manchester during February. (P. 402.)

Mr. A. C. Banfield recommends a reflex of 3½ x 2½ inches size as a most advisable choice for serious tourist photography. (P. 397.)

Two recent patent specifications describe photo-mechanical methods of making stencils for the manifolding machines used in letter copying, etc. (P. 402.)

Dr. B. Homolka has drawn attention to a new developer which gives an image of brown tone, due to addition of a reddish-coloured substance to the black silver deposit. (P. 397.)

The convenience of a metronome in the dark room and a use for empty spool bobbins are the subjects of "Assistants' Notes." (P. 402.)

"COLOUR PHOTOGRAPHY" SUPPLEMENT.

M. F. Monpillard has at length published particulars of the method of greatly increasing the speed of Autochrome plates by extra-sensitising, which he worked out some years ago. (P. 25.)

M. L. Gimpel, who was a collaborator with M. Monpillard in the practical use of the process, has communicated to the French Photographic Society an account of his experiments and instructions for making up the dye sensitising solution, the new ingredient of which is a small proportion of silver chloride dissolved in ammonia. (P. 26.)

Mr. R. M. Fanstone gives a few hints on the making of Autochrome transparencies of garden subjects. (P. 28.)

Professor R. Kögel has drawn attention to a new class of dyes which, it is suggested, may revive the almost obsolete bleach-out process. (P. 28.)

Dr. A. Traube has published some particulars of his Uvachrome process, in which three-colour transparencies are made by dye-toning. (P. 28.)

EX CATHEDRA.

The Small Reflex. We are glad to endorse the recommendation of Mr. A. C. Banfield, made at a meeting of the R.P.S. Pictorial Group, of the 3½ x 2½ reflex camera as the choice of instrument for the serious tourist photographer. Mr. Banfield uses a Soho reflex of this size, finds it light and reliable, and is able to employ focal length of lenses from 4¾ to 12 inches, the former a Ross Xpres and the latter a Dallmeyer Dallon. We agree that the 60 x 45 m.m. size is on the whole too small. Mr. Banfield refers to the difficulty of ensuring the flawless negatives which are necessary in this size, unless the photographer is exceptionally gifted as a retoucher. To this objection may be added the further one that selective focussing becomes impossible with most subjects when employing a lens covering over a normal angle of view. Adopting the reflex in the size of 3½ x 2½ ins., the photographer is not inconvenienced by the bulk of the apparatus and as regards weight, by carrying 24 cut films in a changing box and a further dozen in dark slides, Mr. Banfield's whole load, including three lenses, did not exceed 10½ lbs.—more than some people care to carry in these unpedestrian days; but then the outfit has a wide optical range and provides for 36 exposures in the course of the day, whilst the negatives are usable for contact souvenir prints and are as suitable as can be desired for lantern slides.

* * *

Hydro-coerulignon Developer. In the Festnummer of "Photographische Korrespondenz" Dr. B. Homolka has an interesting note on a developing agent which he has discovered with properties analogous to those of indoxyl. The latter, it may be remembered from Homolka's previous paper (B.J., 1907, February 22, p. 136, and March 22, 1907), has the property of developing the latent image and of attaching to the silver image one of indigo, formed by oxidation of the indoxyl. In the present case the oxidation product, coerulignon, is of orange yellow colour, so that the compound image consisting of it and silver is brown in colour. The developing solution is made up by dissolving 5 gms. of potass carbonate and 10 gms. of soda sulphite with 1 gm. of hydrocoerulignon in 100 c.c.s. of water. The image appears in about half a minute, and development of either a plate or bromide paper is complete in 1 to 5 minutes. By treating the resulting compound image with an alkaline solution of sodium hydrosulphite, the coloured element is reduced and dissolved, leaving the ordinary image of black metallic silver. On the other hand, the use of the Farmer's "reducer" oxidises and dissolves the silver in the image, leaving one of the orange-yellow coerulignon. The results have an interest in their bearing on the theory of developers, but Dr. Homolka does not suggest that the developer is of practical usefulness, although its properties are more attractive in this respect than the blue-image indoxyl.

Reproducing Stained Films. It very often happens that a photographer is called upon to make a print or enlargement from an amateur-developed roll-film negative in which large yellow patches have appeared as a result of uneven fixation. This defect is usually due to the "pull through" system of development and fixing, when the film is usually put to wash immediately the unaltered bromide has disappeared. As no isochromatic bromide papers are on the market, it is necessary to reproduce such negatives. By using an isochromatic plate and yellow light a clean transparency may be easily obtained. If this is to be of the same size as the original, the exposure may be made through an ordinary yellow glass, or even by the yellow light used for developing bromide prints, but for enlargements or reductions a yellow filter, as used for outdoor work or copying, becomes necessary. It is sometimes possible to remove such stains by means of the cyanide and iodine reducer, but if this be not possible, or if the negative is of great value, the reproduction method should be adopted.

OWNERSHIP OF ASSIGNED COPYRIGHT: THE EQUITABLE ASSIGNEE.

A JUDGMENT last week in the Court of Appeal involved, as Lord Justice Bankes said in delivering it, questions of considerable importance in relation to the law of copyright. The original case had nothing to do with photographs, but the circumstances were those which could arise, and doubtless have arisen, in connection with photographs, and, therefore, it is well that we should attempt to express in a popular form the legal difficulties which were discussed. It will be seen that the judgment concerns ownership of copyright which has been split, and particularly the qualification of an "equitable assignee" of part of a copyright to take action in respect to infringement. If we first describe the circumstances of the case, its legal technicalities and the (abridged) text of the present judgment, which we quote on another page from the "Times," will perhaps appear less formidable.

The trouble all began with the singing at Collins's Music Hall, Islington, of two songs, "A Devonshire Wedding" and "Love in Lilac Time." Now the rights in the performance of one of these songs in public (as distinguished from publication in print, etc.) were claimed as their property by the Performing Rights Society, Ltd., who in 1916 had taken an assignment from Messrs. Chappell's, the music publishers, of the right of performance of all songs the right of performance of which belonged to them, and of all others which they might acquire. Similar rights in the other song were founded on a similar title derived from Messrs. Keith, Prowse and Co. Hence, when the songs were sung without permission at Islington, the Performing Rights Society, Ltd., took action against the proprietors of the music hall, the London Theatre of Varieties, Ltd., and in the King's Bench last December judgment was given in their favour by Mr. Justice Branson. It was then held that as "equitable assignees" of the two other companies the Performing Rights Society, Ltd., acquired the equitable title to the right of performing the songs as soon as the copyright of the songs came into existence; and it was also held that as "equitable assignees," though not legal assignees, they could take action by themselves, that is to say, without bringing in as co-plaintiffs the assignor firms who retained the remaining part of the copyright. In other words, so it seemed, no distinction was to be drawn between assignments in equity and assignments in law in interpreting the provisions in the 1911 Copyright Act respecting the right of an assignee to take action for infringement. Mr. Justice Branson seemed to regard the equitable assignee of part of a copyright as possessing a right in this respect equal to that possessed by a person to whom that part had been assigned by a specific legal deed. It is this decision which has been set aside, or at any rate revised, by the Court of Appeal.

For the opinion of Mr. Justice Branson did not appear right to the Court of Appeal. It would seem that the distinction between an assignment in equity and an assignment in law is too serious a thing to be trifled with. Consequently, the Copyright Act is scrutinised in order to see if it is reconcilable with the Court's view of the importance of this difference, even though the reconciliation does violence to the layman's conception of equity. Says the Court of Appeal: By Section 5 of the Copyright Act the owner of a copyright has the right to assign the whole or part of the copyright, provided he does so in writing. By Section 6 it is the owner who is entitled to all civil remedies for infringement. Hence—and this is the crux of the judgment—the first owner or any subsequent owner by legal assignment does not cease to be an owner (within the meaning of the Act) when he executes an "equitable assignment" of the whole or part of his right. From that view it follows either (*a*) that the "equitable assignee" is not an owner at all, or (*b*) that two owners are recognised by the Act in these circumstances, the legal and the equitable. The Court frankly admitted the difficulties in the way of accepting either conclusion from this train of reasoning, but of the two preferred (*b*), viz., that there are at one and the same time two owners of different kinds from the legal standpoint. It clothes this conclusion in less challenging language by saying that the term "owner" in the Act may be regarded as including "equitable owner." Hence, in any action for infringement, the "equitable owner" may not act alone, but must be joined with the legal owner; or, to put it in a more commercial form, if A enters into a general arrangement to acquire certain present and future rights from B, he cannot take action in respect to infringement of those rights, except with the help of B, who has ceased to have an interest in them. In the particular case, the judgment means that the original plaintiffs, if they so choose, can start all over again in conjunction with the legal owners of the copyright; if they do not so choose, the remedy provided by the Act for the infringement goes unapplied.

The judgment, however, by reason of the high order of the Court from which it comes, requires to be seriously considered in relation to copyright in photographs. In the first place, it underlines the necessity for a proper legal assignment in writing of the whole or part of a copyright, if the assignee (purchaser) is to be able to take action in respect to infringement "off his own bat." We infer, for example, that an arrangement between a postcard publisher and a photographer, by which the former should have the right to issue the latter's portraits in postcard form, would be an "equitable assignment" of the kind which was made in the case of the songs, and that the publisher, in the face of the judgment, would require to be joined with the photographer in taking action respecting infringement. While in such cases photographers, as the creators and assignors of copyrights, run no risks of suffering from the effect of the judgment, in other circumstances they may themselves be "equitable assignees," and thus find themselves handicapped in the protection of rights which they imagined they had fully acquired. For example, a

general undertaking may be entered into for the right to issue the existing and future works of an artist in the form of photographs. In the absence of a legal assignment of this part of the copyright in each individual work, the effect of the judgment, as we understand it, is to render the photographer powerless against piracies of his photographic copies, unless the original author of the works is willing to join in proceeding against the infringers. In short, while an "equitable assignment" of the kind illustrated by our examples suffices to determine the relation between the assignor and assignee, legal specific assignment by deed is required as a preliminary condition of legal action by the assignee; failing which, the legal owner of the copyright must appear with the equitable assignee as joint plaintiff in any action for infringement.

HAND-CAMERA NIGHT PHOTOGRAPHY ON EXTRA-SENSITISED PLATES.

[The following is part of a paper by M. L. Gimpel on the extra-sensitising of Autochrome plates which appears on another page in the "Colour Photography" Supplement. Here we place the portion of M. Gimpel's text which deals with the extra-sensitising of ordinary plates, and are indebted to the French Photographic Society for the loan of the blocks illustrating his use of the plates in photographing night subjects by the ordinary illumination.]

The use of the Monpillard ultra-sensitising process for plates for ordinary monochrome photography led me to discover the untruth of a statement which has always deterred me from making endeavours to use extra-sensitised plates for instantaneous exposures on night subjects. The "authorities" agree in saying that extra-sensitising by bathing can yield good results only with plates of medium speed such as the Lumière Blue Label, and that the process can only increase the sensitiveness of the plate to the less refrangible rays of the spectrum to the disadvantage of the general sensitiveness. In discussing this "fact" with M. Monpillard, we agreed that it would be useless to try ultra-sensitising experiments with the ultra-rapid Lumière Violet Label plate which I used exclusively for my Press work on account of its great speed. Nevertheless I thought to myself that it might be worth while

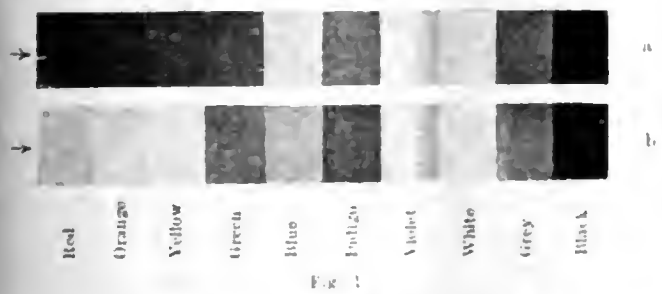


Fig. 1.

Fig. 2.

Fig. 3.

to try it. Practice is not always in accordance with theory, and, moreover, the process is something new.

I was fortunate, for of all the plates which I tried only the Lumière Violet Label gave me the interesting results which, in the most favourable circumstances, allow of shutter exposures by the ordinary artificial illumination of rooms or streets. The photographs (Figs. 1 to 4) will show the nature of these results better than a long explanation. Fig. 1a is of a coloured chart photographed on an ordinary Violet Label plate with an exposure of 20 seconds at *f*/64 by the light of two 25 c.p. lamps placed at a distance of about 10 inches, one on each side of the chart.

Fig. 2b was obtained with half the exposure on an ultra-

sensitised Violet Label plate. It will be seen that there is as great sensitiveness to the grey square, considerably more to the red and orange, and particularly to the yellow, to which latter the ultra-sensitised plate is 20 times as sensitive. The exposure corresponds with 1/25 of a second at *f*/4.

Fig. 2 is a photograph taken at a *fête* of Joan of Arc on May 4, 1913. The lighting consisted entirely of candles held by the nuns and fairy lamps hung in the trees. The exposure was 10 secs. at *f*/4 on an ultra-sensitised Violet Label Lumière plate.

Fig. 3 is an exposure, of a quarter of a second at *f*/4, made in a bar on the Boulevard St. Denis, lighted by neon and mercury-vapour tubes. The same plate was used.

In Fig. 4, again on a Lumière ultra-sensitised Violet Label plate, the subject was the Place de l'Opera on the occasion of the visit of the King and Queen of England on April 22, 1914. The exposure was 5 secs. at *f*/4.

[Other examples were shown by M. Gimpel, among them scenes from "Kismet," taken under the ordinary stage lighting.]

The ordinary ultra-sensitised plates keep somewhat better than Autochromes which have received the same treatment. They retain their properties for about 36 hours. The process of sensitising is exactly the same, except that the time of immersion is 5 minutes, on account of the greater thickness of the film. For the same reason drying is slower, but is complete in about 10 minutes.

For development I use my usual formula of metol and hydroquinone. Plates, of course, require to be handled with even more care than panchromatics, but those who wish can

Fig. 4.

work in ample yellow light by employing the safranine or aurantia desensitiser.

L. GIMPEL.

THE WASHING OF NEGATIVES AND PRINTS.

[A paper recently read before the Royal Photographic Society by Messrs. K. C. D. Hickman, B.Sc., and D. A. Spencer, A.R.C.Sc., entitled "A Constructive Criticism of Washing Devices and Optical Methed of Testing," has been printed in the Society's "Journal" as the first part of a comprehensive communication on this subject, It contains many experimental data bearing directly upon the practical methods of washing negatives and also prints. With much ingennity the authers illustrate side by side their experiments and the results obtained as regards unifermity and completeness of washing, and they describe their inventions for the washing of plates, among them one which has already been placed upon the market in the shape of the Hickman "Circulator." The paper certainly represents the most scientific experiments which have been made on the removal of hypo from gelatine films by washing, and are deserving of a close study on account of the great ameunt of practical information which it contains.]

(*Concluded from page* 390.)

It would appear, therefore, that to project water in a uniform current in the plane of the plate is not necessarily the most economical way of using it. It is advantageous to introduce cross streams and currents normal to the surface to give the freshly diffused substances a chance to escape. That even moderate disturbance of a uniform stream is beneficial was shown by washing two halves of a dyed plate in the river washer, (*a*) in the normal stream, (*b*) the same, but with a series of waves artificially maintained on the surface. Time of clearance was shortened by 3 minutes (Fig. 6, Plate 6).

An attempt was now made to apply the lessons learnt in the foregoing experiments to the production of an efficient apparatus for washing plates. It must combine the efficiency of the "successive change" method with the convenience of running water, and it must be attachable to any existing dish or trough. It should be automatic in action and should operate with a small volume of water in the dish, which it should agitate vigorously and irregularly, and change rapidly.

The following apparatus, while not so efficient with regard to water as demanded above, fulfils the other conditions. Fig. 2, Plate 6, shows a delivery pipe W placed over the edge of a photographic dish. A stream of water travels up the centre, branches at the top, and returns round the sides to the point of origin. Here it is picked up by a siphon Y attached to a suction pump. The apparatus acts efficiently because :—

(1) Fresh water enters with considerable velocity and makes a complete circuit of the dish before removal.

(2) Owing to the change of direction at the top, water is piled up at various points, and waves are projected and reflected in all directions (Fig. 1, Plate 6).

(3) The water in the dish is at a constant level, determined at will by the height of the outflow. By maintaining a small depth, many changes are obtained with little water expenditure.

The supply jet and exhausting siphon have been combined to form the improved apparatus shown in Fig. 3, Plate 6. The delivery tube passes through the head of the exit pipe, where it creates a partial vacuum by reason of a venturi constriction. With the lower bend of the outflow sealed with water, siphon action is initiated when the level of the water in the dish covers the exit holes. The action is automatic, and has been found to be satisfactory in practice. The "circulator" mentioned above refers to this device.

The following remarks serve to explain the results tabulated above.

Water falling into the centre of a small dish gives efficient washing because the changes are frequent, the relative dimensions enabling a convection vertex to be maintained (Fig. 1, Plate 4).

Dropping water on to the side of a dish to induce transverse currents has long been recommended, the course of the water being pictured as in Fig. 3, Plate 4. The actual course, revealed by coloured streams, is more as pictured in Fig. 2. Prints (*c*), (*d*). and (*e*) shew how unreliable the methed is.

The divergence from theory is most marked in the case of the siphon tanks, Figs. 1 and 2, Plate 2. In the light of these experiments this is explained by the stillness of the water, washing being rapid only in the region of the entrance holes. An important point is the tendency for the deposition of air bubbles on the film, owing to the water not receiving sufficient agitation after leaving the tap. (See prints J, K, Plate 2.)[9]

9. These spots are distinctly visible in the original prints.—ED.

The river washing device was capable of washing many plates in series, but its efficiency was disappointing except for the foremost plate. It was retained merely as a standard instrument of research.

In order to render the washing times for dyed plates of value to the practical worker, an attempt was made to correlate them with those obtained for plates washing free from hypo. This was accomplished in one case only, as in Fig. 3, Plate 5, with four plates in a 15 by 12 dish. The results were shown graphically in Figs. 1*a* and 1*b*, Plate 1. It is seen that the hypo diffuses roughly

FIG 1

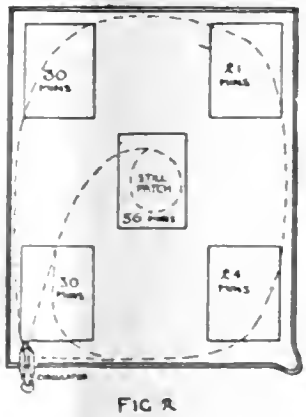


FIG 2

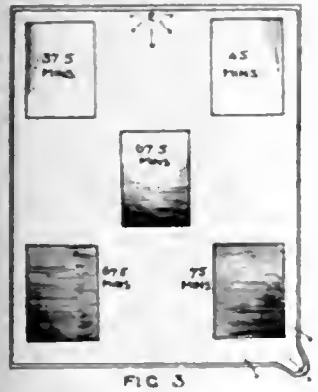


FIG 3

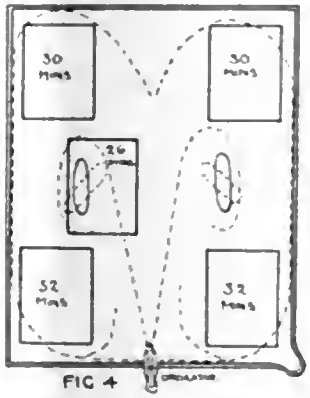


FIG 4

Plate 5.

ten times as fast as the dye in each of the four positions, though they correspond with very different conditions of water supply.

It must be borne in mind that the washing times, unless otherwise stated, are for one plate only in each apparatus. Where the water is being changed rapidly, the figures will remain constant for plates added subsequently, but where this is not the case (as in Fig. 3, Plate 5), subsequent introduction of plates will contaminate the water to such an extent that it may be impossible to reach the limiting concentration in any reasonable time.

Summary.

A suggestion is put forward for calculating the quantity of residual hypo permissible in a photographic plate.

Washing devices are compared with respect to their water-changing properties, and are further tested practically.

The conditions underlying the rapid washing of plates are investigated qualitatively by means of a coloured dye.

A preliminary figure is given, correlating these results with those for the washing of plates containing hypo.

Recommendations are made for the production of an efficient washing device.

Note on a Rocking Machine used in these Experiments.

In the diagram, Fig. 3, Plate 6, A is a flexible diaphragm in connection with a water supply pipe W, and a siphon outflow C. An air inlet tube D joins C at *b*. Water entering by W swells A, developing pressure as it mounts C. When it reaches the head it flows down the other side, the pressure in A falls to zero, and air is sucked in through D, thus breaking the siphon. The cycle then repeats itself. This changing pressure on the diaphragm A causes it to rise and fall; and this motion has been used to operate the rocker shown in plan in Fig. 4. Here two expanding rubber bladders and a universal joint form a three-point support for the rocking table T. The water supply passes through two miniature filter-pumps P, and inflates the bladders with air and liquid. These separate into two layers, affording the means of sealing and breaking the siphons, as well as economising in water. The bladders work out of phase, and, owing to their elasticity, with continually changing amplitude, rocking a dish placed on the table in every direction. The absence of a definite cycle avoids the production of streak marks on the plates being rocked. It may be remarked that a rocker built on these lines, and with bladders 3 inch diameter, in series with 24 inch siphons, has been in

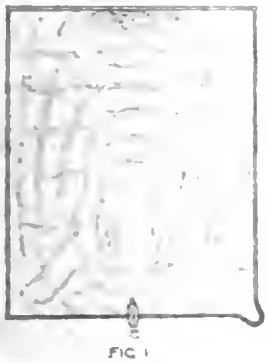


FIG 1

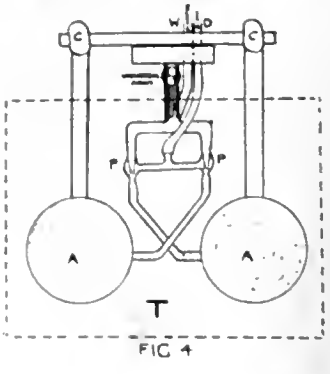


FIG 4

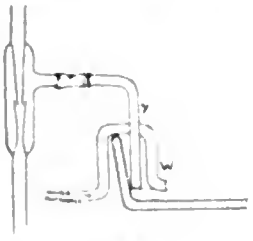


FIG 2

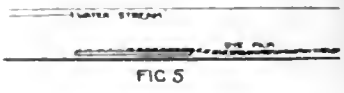


FIG 5

FIG 6

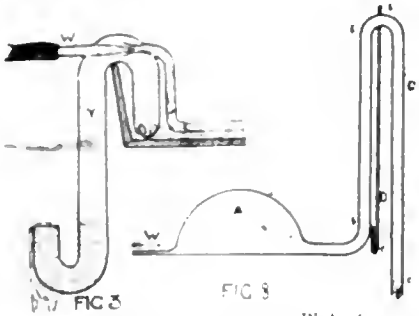


FIG 3

FIG 8

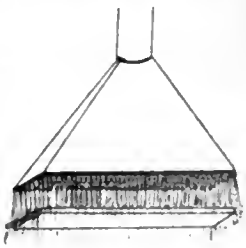


FIG 7

Plate 6.

continual use for some months without attention. It will agitate a 12 inch by 10 inch porcelain dish with normal contents.

In conclusion, our thanks are due to Professor H. B. Baker for the generous facilities placed at our disposal, and to Mr. H. J. T. Ellingham for the valuable interest he has shown throughout.

K. C. D. Hickman, B.Sc.
D. A. Spencer, A.R.C.Sc.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

A Use for Spool Bobbins.

THE accumulations of empty spool bobbins, which occur in D. and P. rooms, often give rise to the question, "Cannot anything useful be done with them?" or the remark, "What a pity to waste all those." While not pretending to have found a use for the masses of bobbins which collect every season, I have found an occasional use for odd ones, for a purpose for which they are eminently suited.

They make very efficient wall plugs. Most photographers at some time or other have need to put up a new fixture, or repair an old one, and these jobs are never so awkward as when support is taken from a brick wall. The time-honoured method of smashing a hole in the wall with a cold chisel, and plugging it with a lump of wood, is neither pleasant to do, nor nice to look upon. With the aid of an old bobbin the matter is greatly simplified. All that is necessary is to make a deep hole between two bricks, with a six-inch nail and a hammer, and to remove the metal cap from the split end of the bobbin. This end then needs shaving down a trifle. The nail must be driven into the wall as cleanly as possible, and removed without enlarging the surface end of the hole any more than can be helped. If a selection of different sized bobbins is at hand a length can be chosen according to the depth of the hole, which, in its turn, should depend on the weight of the fixture. This is naturally a matter of guesswork raher than precision, but a couple of No. 1 Brownie bobbins will hold at least ten or twelve pounds, and two 3-A's will hold very much more. Having removed the nail, the bobbin is hammered in by blows on the metal end. There is no risk of splitting the wood, and when the cap is flush with the wall, it hides any unsightliness due to loosened mortar. The hole for screw or nail is already in position, and again splitting is avoided, and a long screw can be used with advantage. Small bracket shelves can be fitted to the workshop wall in a minimum of time in this way. It is also possible to construct a set of shelves by securing further pieces of shelving to the first by sets of four equal sized bobbins without caps removed, screwed leg fashion at the corners of the shelves. If the series is carried any height, however, it will be advisable to fix both top and bottom shelves to the wall.—THERMIT.

Timing in the Dark Room.

A USEFUL piece of apparatus to have in the dark-room is a metronome, an instrument used by those whose business it is to teach the young the meaning of time and rhythm in music.

For timing the exposure of bromide paper up to 60 seconds, if set to beat once to the second, it relieves the printer of all necessity to take his eyes from the work, a very great help when a particular piece of shading has to be performed.

For example, suppose that a number of enlargements are wanted where, say, the foreground has to receive 10 seconds' extra, and a sky printed in from another negative which requires 3 seconds.

The steady ticks of the metronome, so easy to count, enable one to expose a succession of sheets of paper with absolute uniformity, leaving at the same time the hands free, and also enabling the eyes to be kept on the shading, which, unless this is done, is liable to stray behind its proper limits with unpleasant results. A metronome may frequently be purchased secondhand for about 10s., the price new is 20s. to 25s.—E. S. TARDREW.

THE 1923 NORTHERN EXHIBITION.—The Northern photographic exhibition will be held in the Manchester City Art Gallery during February, 1923. The management have decided to make admittance free to the public, and are leaving no stone unturned to maintain the best traditions of the Northern when previously held in Manchester. Full particulars will be announced shortly, but meanwhile the organisers, a moving spirit among whom is Mr. S. L. Coulthurst, take this first opportunity of asking for the support of exhibitors throughout the world. They desire to point out that every picture will be submitted to the judges before any hanging is done, and that the judges will be required to mark each submitted exhibit A, B, or C, these markings respectively denoting: A, must be hung: B, may be hung if space, etc., permits, and C, must not be hung.

Photo-Mechanical Notes.

Stencils by Photographic Methods.

PHOTOGRAPHIC methods of making the stencils used in letter-copying and manifolding machines are the subjects of two recent patent specifications. According to No. 179,593, granted to Louis Sterck and Roneo, Ltd., a photographic negative is produced on either a wet plate or a dry plate, the object appearing thereon either of the same size as the original, or a reduction or an enlargement thereof as required. From the negative a positive is obtained, either through the camera or by contact, and a screen may be used in obtaining the negative or the positive plate according to the nature of the original to be reproduced by the photo metal stencil.

A polished sheet of brass, copper, zinc, or other metal is next coated with a suitable sensitiser such as albumen, bitumen, or enamel, and a negative copy is made to appear upon the metal sheet by exposing it to the light through the positive plate in a printing frame. After the necessary amount of exposure has been given, the sensitised metal negative is developed according to the particular sensitiser used.

In the event of some retouching of the negative metal plate being required, this can be effected with any acid-proof substance.

The metal negative is now ready for etching, and the print or design shows quite clean, and is free from any acid-proof substance. The metal negative is now placed in an acid bath, and the etching process is continued until the copy appearing on the metal is etched right through the metal.

As, however, it often happens that the metal is not of even thickness, some parts of the metal will be etched through quicker than the remaining parts. When this occurs, the metal plate should be removed from the bath, washed and dried, and further action of the acid on the etched-through part prevented by applying a suitable anti-acid coating thereto.

The metal plate is again placed in the acid bath, and is then washed and dried, and, if desired, deprived of the adhering substance by means of pumice stone, and now appears as a photo-metal stencil ready for use with a rotary duplicating machine or a flat frame duplicator.

In the event of the stencil being too thin, an absorbent strengthening material such as flannelette, felt, velvet or the like is applied thereto.

Reference has been directed by the Comptroller of Patents, in pursuance of Section 7, Sub-section 4, of the Patents and Designs Acts, 1907 and 1919, to Specifications No. 5,402 of 1896, No. 10,073 of 1899, No. 14,374 of 1899, and No. 3,988 of 1911.

According to Specification No. 178.884, of David Gestetner, Neo-Cyclostyle Works, Tottenham Hale, London, N.17, the stencil layer is produced by causing a silver image formed by the action of light upon a sensitive silver salt to interact chemically with a composition, as, for instance, bichromated gelatine, in order to change the solubility of the composition in a medium used as a developer.

The invention in one phase comprises producing a print by the action of light upon a silver compound, such, for instance, as is employed in coating bromide paper, and bringing together the print and a pellicle (of a composition adapted by the chemical action of the silver image on the colloid to change in respect of its solubility) in a developing medium, under conditions to effect such change, and developing the pellicle.

The pellicle may be coated on a temporary support or on a final support of a porous character, as, for instance, Yoshino paper, in which latter case it may be desirable to bring the back of the coated support into contact with the silver print.

Alternatively, the material adapted to act as the final support of a porous character may be coated or treated with a composition containing a suitable sensitive silver compound, and after producing thereon a silver print, a pellicle of a suitable composition, as, for instance, bichromated gelatine, may be applied, in conditions adapted to effect the desired change in the solubility of the composition.

The silver print in either case may be treated in a manner similar to that followed in the Ozobrome (Carbro) process, with a solution of bichromate, fericyanide, and bromide of potassium.

Another phase of the invention comprises producing by photographic means a silver image on a layer of an emulsion of a sensitive silver salt in a composition the solubility of which, in a medium, as, for instance, warm water if the composition is bichromated gelatine or gum used subsequently as a developer, is adapted

to be changed in accordance with the intensity of light-action on the layer, treating the layer to effect the desired change in solubilty and developing the treated layer.

The layer of emulsion may be constituted by a gelatine emulsion resembling the emulsion used in making bromide paper, but preferably not hardened, and the support coated with this emulsion may be exposed, treated in the usual way to produce a silver print, treated, if necessary, to change the solubility of the gelatine in the medium subsequently used as a developer, and finally developed, as has previously been proposed in the production of "pigment" or "carbon" prints.

Alternatively, a support, similarly coated, after exposure and development of the silver image, may be sensitised by means of a suitable agent, as, for instance, a bichromate exposed to the action of light and redeveloped to remove those portions of the gelatine layer which have been less affected by the action of light as the result of the silver image preventing or reducing the action of light upon the sensitising agent.

The gelatine emulsion containing the light-sensitive silver salt in this phase of the invention may be supported on a porous material, as, for instance, Yoshimo paper, adapted to act as the final support.

Alternatively, the gelatine emulsion containing the sensitive silver salt may be coated on a support from which it may be stripped and transferred to a suitable final support for use as a stencil.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications June 19 to 24 :—

APPARATUS.—No 17,107 Photographic apparatus. W. A. Lawton.

APPARATUS.—No. 17,063. Photographic apparatus. W. Feuerzeug.

LENSES.—Nos. 16,902 and 16,903. Photographic objectives. C Graf.

ELECTRICAL PHOTOGRAPHY.—No. 17,227. Electrical photography. D. Charles.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country or abroad, in the case of patents granted under the International Convention.

PHOTOGRAPHS WITH SPECIAL BACKGROUND EFFECTS.—No. 175,020 (January 28, 1921). This invention relates to means for taking photographs with special scenic or background effects, and its object is to provide means whereby a background of any size or proportion in relation to the size of the objects or figures to appear in front of the background, can be photographed at the same time as the objects or figures by one exposure, the resultant effect being that the figures or objects appear in proportion to the view forming the background.

A further object is to provide improved means for taking either stationary or moving pictures whereby in one exposure a background or the like and figures, objects or the like, can be photographed to provide a natural or grotesque picture, the background and figures or objects being of different proportionate sizes in relation to each other and arranged at different angular positions with respect to the camera employed for taking the picture.

A further object is so to arrange the background that during the taking of the photograph of the figures or objects and the background, the latter will be away from its normal position so that the figures can be illuminated to a greater degree than the background, or *vice versa*, thus enabling certain parts of the resultant picture to appear particularly prominent.

A further object is so to arrange the background that the objects, figures or the like which are being photographed in connection therewith can during the taking of a moving picture appear to vanish or pass away to provide an illusion effect, while a further object is so to arrange the background that it may be a picture, painting or view of any size or colour or a screen upon which cinematograph pictures are adapted to be projected.

The invention consists in providing a portable device for attachment to, or use in connection with, cameras for taking photographs with special scenic or background effects comprising

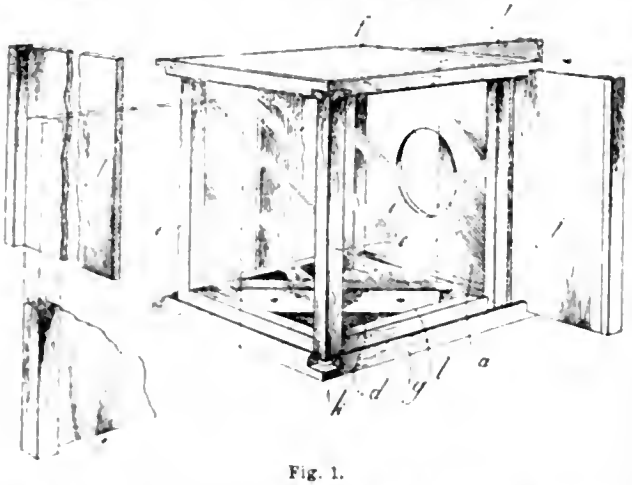


Fig. 1.

a frame work or support and a transparent screen arranged in connection therewith at an angle of substantially 45 degrees to the plane of the lens of the camera, so that the photographing of a background and objects, figures or the like can be performed in one exposure. For instance, a background in the nature of a stationary or moving picture, painting or the like may be arranged

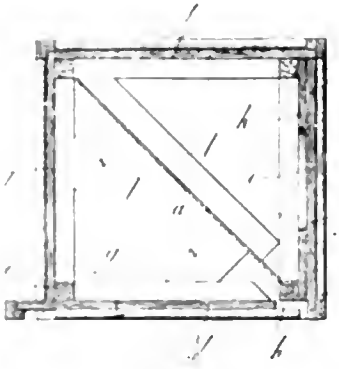


Fig. 2.

to one side of the camera and the objects, figures, etc., to be photographed may be arranged in front of the said camera.

Fig. 1 is a perspective view of one form of cabinet for use in conjunction with a camera. Fig. 2 is a sectional plan thereof, and figs. 3 and 3 are diagrams of the means employed for taking photographs.

According to one form of this invention a screen of suitable

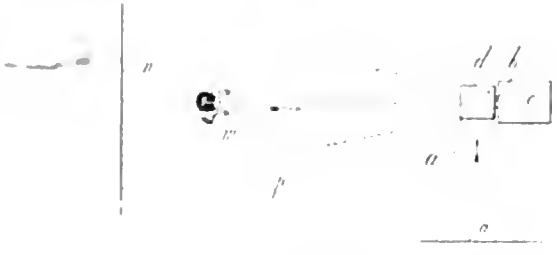


Fig. 3.

transparent material *a*, such, for instance, as sheet or plate glass, is arranged at an angle of 45 degrees in front and adjacent to the lens *b* of a camera *c* it is desired to employ to photograph figures or objects placed in front thereof. This transparent screen *a* is preferably mounted in a suitable frame cabinet *d*, which comprises a skeleton framework *e* fitted with a top *f* and bottom *g*.

One side *h* of the cabinet *d*, which is adapted to be placed adjacent to the camera *c* may be enclosed, and in such cases it is provided with an aperture *i* of suitable size to permit the photograph to be taken by the lens *b* of the camera *c*. In use two sides of the cabinet *d* are normally open, but in the construction shown they are adapted to be closed or partially closed by sliding panels *j* mounted in suitable grooves *k* formed in the top and bottom covers *f* and *g* of the cabinet *d*. The top and bottom of the glass screen *a* is preferably supported by suitable members *l* secured to the top and bottom of the cabinet. In front of the cabinet *d* and camera *c* which latter is disposed a short distance to the rear of the cabinet *d*, is arranged the object or figures indicated at *m* which it is desired to photograph. These objects *m* are arranged at any suitable distance from the camera *c* and in front of a background screen *n* of opaque material, such as a black or dark-coloured screen. The floor upon which the objects are arranged is also of dark material. Means not shown are provided preferably at the side of and in front of the screen *n* to illuminate the objects or figures *m* in any desired degree. The illuminating means are preferably so arranged that the light will not fall upon the darkened screen to the rear of the objects or figures. To one side of the cabinet *d* is arranged a background *o* which may be in the nature of a picture or painting of any colour or size, or it may be in the nature of a moving picture. In this

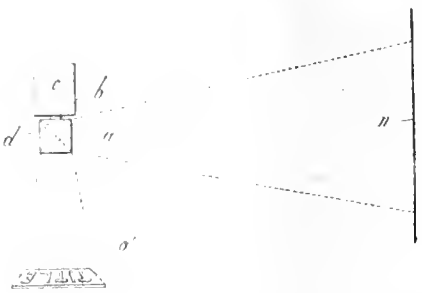


Fig. 4.

latter arrangement the background screen *o* is preferably transparent, so that moving pictures from a suitable cinematograph apparatus arranged at the rear thereof may be projected thereon. The picture which is adapted to constitute the background is suitably illuminated so that its reflection will be conveyed to the angularly arranged screen *a* of the cabinet *d*. Thus when a photograph is taken by the camera *c* a reproduction of the background *o* reflected on the screen and the objects *m* in front of the screen *n* will be produced on the plate or the like in the camera. It will thus be seen that a background *o* can be of small size in proportion to the figures *m* to be photographed. Upon one exposure of the plate a picture will be reproduced of the figures, together with the background. The camera employed may be an ordinary camera or one especially adaptable for taking cinematograph photographs. In the latter cases the background *o* may be movable or the objects or actors may be arranged to move in front of the darkened background *n*. It will be understood that the cabinet *d* and/or the transparent screen may be provided with means whereby either or both may be adjusted in relation to each other as desired.

In order to take imaginative pictures, places or, for instance, visions or apparitions, a suitable opaque and darkened screen indicated at *p* in fig. 3 is arranged in front of the main darkened screen *n* and to one side of, for instance, a figure indicated at *m* being photographed. When it is desired to cause the figure to vanish during the taking of the photographs, the figure moves or is caused to move to one side behind this auxiliary darkened screen *p*. Thus when the photographs taken by the camera are reproduced a very natural vanishing effect will be apparent. It will be understood that apparatus may be employed to take photographs of various composite pictures and figures in a simple manner and by one exposure for each photograph, and be equally efficient for producing ordinary photographs on various forms of background or for cinematography.

If desired, other effects may be arranged in front of the camera to combine with the background when the photographs are taken. For instance, as shown in fig. 4, the cinematograph camera *c* and the cabinet *d* are arranged in a vertical position to photograph a title *o'* disposed on the floor and a scenic effect arranged on the screen *n*.

It will thus be seen that, for instance, people may be photographed together with backgrounds which are of reduced size and proportion, but by the above-described means the resultant picture is such that this relative difference in proportion is rectified to provide natural pictures or varied to produce grotesque pictures. If desired, the panels may be in the form of or provided with vignetting screens.

In cases where the background or picture to be reflected is too small to come within the range of the focus used on the figures, after necessary stopping down, a lens or magnifying glass may be arranged between the reflector and the picture. The magnifying glass, when such is employed, is preferably arranged in one side of the cabinet. The focus of the picture is preferably adjusted to the focus of the camera.

In a modified construction the transparent screen is angularly arranged inside a camera having a lens in front and at one side, so that pictures may be taken on a negative arranged at the back of the transparent screen of objects and backgrounds disposed in front and at the side of the camera.—Godfrey Heathcote Sutcliffe, 57, Argyle Road, West Ealing.

Trade Names and Marks.

MARKS PLACED ON THE REGISTER.

The following marks have been placed on the register :—

KODAK TESTED CHEMICALS (DESIGN).—No. 421,047. Photographic chemicals. Kodak, Ltd., Kodak House, Kingsway, London, W.C.2, dealers in photographic materials.

APEM.—No. 419,775. All goods included in class 1. Amalgamated Photographic Manufacturers, Ltd., 3, Soho Square, London, W.1, manufacturers.

APEM.—No. 419,776. All goods included in class 8. Amalgamated Photographic Manufacturers, Ltd., 3, Soho Square, London, W.1, manufacturers.

APEM.—No. 419,777. All goods included in class 13, but not including needles or fastenings for collars, and not including any goods of a like kind to these excluded goods. Amalgamated Photographic Manufacturers, Ltd., 3, Soho Square, London, W.1, manufacturers.

APEM.—No. 419,778. All goods included in class 39. Amalgamated Photographic Manufacturers, Ltd., 3, Soho Square, London, W.1, manufacturers.

Patents.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, JULY 10.

Southampton C.C. Trimming and Mounting Competition.
Wallasey Amateur P.S. Competition—"Print Trimming."

TUESDAY, JULY 11.

Bournemouth C.C. "Intensification and Reduction." J. Thomas.
Exeter Camera Club. 1920 Affiliation Competition Prints.
Manchester Amateur P.S. Exhibition of Portfolio Prints.

WEDNESDAY, JULY 12.

Edinburgh Phot. Soc. Outing to Craigmillar and Duddingston.
Rochdale Amateur Phot. Soc. Photographic Chat.

THURSDAY, JULY 13.

Hammersmith Hampshire House Phot. Soc. "Bromide Toning." A. Hanson.

SATURDAY, JULY 15.

Edinburgh Phot. Soc. Outing to Borthwick Castle.
Exeter Camera Club. Outing—Nutbrook, Withycombe, Exmouth.
Hammersmith Hampshire House P.S. Outing—Ashtead Woods.
Sheffield Phot. Soc. Outing to Edale.

Southampton C.C. Outing—Along the Itchen to Winchester.
South Suburban Phot. Soc. Outing—St. Albans.
Wallasey Amateur Phot. Soc. Outing—Runcorn and Widnes.

CROYDON CAMERA CLUB.

Mr. F. Ackroyd lectured on "Internal Combustion Engines," and scored heavily for the informal session, which many infinitely prefer to the orthodox photographic side. In the clearest possible way he sketched the history, and then turned in detail to the various functions of petrol and other internal combustion engines.

The start would certainly have embarrassed other than a Croydonian, for a chance observation threw Mr. Rose into reminiscent vein. Interposing, after a long preamble, he gently murmured, and completely murdered a good tale next on the list in the lecturer's notes. Then Mr. Salt's recollections on the "Otto cycle" necessitated some discursive observations, and drew from the patient Mr. Ackroyd a remark that a few more interruptions of the same sort would practically exhaust in advance the lecture he proposed to give. "Have I your kind permission, gentlemen, to continue it," he humbly asked, and, receiving a gracious assent, resumed his discourse without further outside aid.

The evening concluded with the ignition of petrol and other fluids employed. Prior to the war, he said, if the petrol gave out it was possible to run home on a bottle of whisky. A test then made with the club's up-to-date brand proved its efficacy in a contrary direction. As a fire extinguisher nothing better could be desired.

Commercial & Legal Intelligence.

Legal Notices.—Notice is given that a general meeting of the members of Photo Productions, Ltd (in voluntary liquidation), will be held on August 3, at 3 p.m. at 1, Eton Terrace, Richmond, Surrey, for the purpose of considering the liquidator's report, showing the manner in which the winding-up has been conducted, and the property of the company disposed of.

Equitable Assignees of Copyright.—In the Court of Appeal last week judgment was delivered by Lord Justice Bankes, Lord Justice Aitken, and Lord Justice Younger in the case of the Performing Rights Society Ltd., v. London Theatre of Varieties, Ltd. Although the action did not relate to works of graphic art such as photographs, the judgment has a far-reaching effect in respect to the remedy for the infringement of copyright acquired by assignment under certain conditions, and from this standpoint is the subject of an article on another page.

The following abridged text of the judgment is quoted from the "Times":—

Lord Justice Bankes, in the course of his judgment, said:—This appeal raises two questions of considerable importance, the one in relation to the law of copyright, the other in relation to the law governing trade unions. The action was brought by the respondents, a company registered and incorporated under the Companies Act, claiming an injunction to restrain the appellants from infringing their copyright in the right to perform in public musical works in which the right of performance was in the respondents. The two main grounds of the defence to the action were (1) that the respondents were a trade union within the meaning of the Trade Union Acts, 1871 to 1913, and as such their registration and incorporation as a company were void and unlawful; (2) that the respondents were not the owners of the copyright which they claimed, so as to maintain the action in their own name. The first question presents little difficulty. Mr Justice Branson decided it in favour of the respondents. In my opinion he was right.

The point with reference to the right of the plaintiffs to sue in their own name raises a serious and important question of copyright law. It arises in the following circumstances. In the case of the song "A Devonshire Wedding" the plaintiffs had, on June 26, 1916, taken an assignment from Messrs. Chappell & Co., Ltd., of the right of performance in all parts of the world of each and every song, with the words thereof, or musical work, not being a musical play, the right of performance of which then belonged to, or should thereafter be acquired by, or be or become vested in them, during the continuance of Messrs. Chappell's membership of the plaintiff society. The song in question was not then composed, and it was not until January 3, 1919, that the composer assigned the right of performance to Messrs. Chappell. The plaintiffs' claim to the copyright in the second song referred to in the pleadings was founded on a similar title derived from Messrs. Keith, Prowse & Co.

The plaintiffs did not dispute that, in these circumstances, their only claim to the copyright in the two songs was as equitable assignees from Messrs. Chappell and Messrs. Keith, Prowse & Co. The defendants contended that an equitable assignee of copyright could not sue in his own name for infringement, but must do so either in the name of the owner at law, or must make the owner at law a party to the action, in order that he might be bound by any judgment obtained. Having regard to the equitable rule as to priorities between the equitable and the legal owner of property without notice, I think that the defendants' point must be well founded, unless there is some provision in the Copyright Act which justifies a decision in the plaintiffs' favour. If it were not so a person might be liable to be sued for infringement both by the legal and by the equitable owner of the copyright, and that in spite of the fact that in each action he might have a complete defence against the owner other than the one by whom he was at the moment being sued. In spite of the inconvenience of holding that a mere equitable owner of copyright cannot sue for infringement in his own name I am not prepared to hold that he can, unless the statute in clear language gives him that right.

The Copyright Act, 1911.

The Copyright Act, 1911, is the statute to which reference has to be made. Section 5 is the section which deals with the ownership of copyright. It defines who the first owner of copyright of a work shall be. It confers upon the owner of the copyright in any work the right to assign the right or to grant any interest in the right by licence provided that the assignment or grant is in writing signed by the owner. It is the owner of the copyright who is entitled to all civil remedies for infringement (section 6), and no person is entitled to copyright or any similar right in any literary, dramatic, musical, or artistic work, whether published or unpublished, otherwise than in accordance with the provisions of the Act (section 31).

The effect of this legislation is to render it possible that there should be within the meaning of the statute two owners of the copyright in any work at one and the same time. In the case where the copyright is, so to speak, split, section 5, subsection (3) recognises both the assignee and the assignor as owners of their respective rights. Under the proviso to subsection (2) of section 5 the legal personal representatives of an author who was the first owner of copyright in his work are the owners of the reversionary interest in the copyright expectant on the termination of the period indicated in the Act. I can see nothing in the statute from which I can draw the inference that an owner of copyright, whether the first owner or any subsequent owner by legal assignment, ceases to be an owner within the meaning of the statute when he executes an equitable assignment of the whole or part of his right. If this is so, it follows either (*a*) that the equitable assignee is not an owner at all within the meaning of the statute, or (*b*) that the statute recognises in these circumstances two owners, the legal and the equitable, of the one right. Whichever view is correct it appears to me that, apart from authority, the result in this action is the same, namely, that the plaintiffs should not be allowed to maintain the present action without adding the legal owners of the copyright.

If the first conclusion is the correct one, then the action cannot proceed without them. If the second is correct, then the Court, in the exercise of its discretion, should not allow the action to proceed in the absence of a party who may be interested and who ought to be bound, or whose presence might afford a defence to the defendants. There are difficulties in the way of accepting either conclusion, but the difficulty of accepting the second appears to me to be less than that of accepting the first. If the first is accepted the logical conclusion appears to be that no equitable assignee of copyright can ever maintain a claim for infringement either in a Court of law or equity, because the Act of Parliament only recognises the owner as the person who can claim the assistance of the Courts, and on this assumption the equitable assignee is not the owner and can never become the owner, unless and until it either becomes possible for the owner to make a legal assign-

ment of the right or he can be persuaded or compelled by process of law to make such an assignment.

I do not think that the language of the statute justifies such a conclusion, and I prefer a construction which includes the equitable owner in the expression owner, and then leaves it to the ordinary practice of the Courts to secure all proper parties being before the Court. I think that this view is in accordance with the practice as it existed before the Judicature Act, and before the passing of the Copyright Act, 1911.

After referring to the authorities, his Lordship said :—For the reasons I have given, I am unable to agree with the view taken by Mr. Justice Branson on this part of the case, and I think that he should have given effect to the defendants' objection to want of parties, but on proper terms should have acceded to the plaintiffs' application to join the legal owners of the copyright.

With reference to Mr. Maugham's argument on this part of the case, founded on the provision of Order XVI., Rule 11, that an action is not to be defeated by reason of the non-joinder of parties, I would only observe that the Court gives effect to that rule, not by ignoring parties, but by adding them where necessary, and that where the presence of a party appears to be necessary it is not sufficient to urge in his absence that he is a bare trustee for the person who is bringing the action.

I think that the appeal must be allowed, with costs, but the respondents must have an opportunity of amending by adding the legal owners of the copyright as parties, but only upon the terms offered them in the Court below—namely, on paying all costs thrown away, in any event. If the respondents elect within ten days to amend on these terms, then the order of this Court will be an order setting aside the judgment, and directing a new trial upon the terms of the respondents paying all costs of and caused by the amendment, and all costs thrown away, including the costs of the appeal, in any event; any costs of the first trial not included in the above order to abide the event of the new trial. If the respondents elect not to amend then the judgment is set aside, and entered for the appellants, with costs here and below.

Lord Justice Aitkin and Lord Jusice Younger agreed.

NEW COMPANIES.

K. D. Photographic Inventions, Ltd.—This private company was registered on June 23 with a capital of £7,500, in 7,000 shares of £1 each and 10,000 ordinary shares of 1s. each. Objects : To acquire and deal in any patents, etc., conferring an exclusive or non-exclusive or limited right to manufacture and sell photographic apparatus and chemical fluids and the like, and to carry on the business of photographers, producers of pictorial photography, manufacturers of and dealers in cameras and other photographic and film-producing apparatus, etc. The subscribers (each with one share) are :—R. W. Bolton, 140, Rosebery Avenue, Manor Park, Essex, managing clerk; Daisy Philipps, 54, Wiltshire Road, Brixton, S.W.9, shorthand typist. The subscribers are to appoint the first directors. Secretary : R. W. Bolton. Registered office : 87, Moorgate, E.C.

Wellington and Ward, Ltd., was registered as a private company of June 27, with a nominal capital of £200,000, in 50,000 10 per cent. cumulative preference and 150,000 ordinary shares of £1 each. The objects are : To acquire the business carried on at Elstree, Herts, and elsewhere, as Wellington and Ward; to adopt agreements (1) with J. B. B. Wellington, H. W. Hall, and H. H. Ward (vendors); (2) with J. B. B. Wellington; (3) with H. W. Hall; (4) with H. H. Ward; and (5) with C. S. Downing; and to carry on the business of manufacturers of photographic plates, papers, films and chemicals, photographic apparatus and materials, etc. The directors are:—J. B. B. Wellington, The Leys, Elstree, Herts; H. W. Hall (chairman and managing director), Bennington Park, Stevenage, Herts; H. H. Ward, Warfield, Radlett, Herts; C. S. Downing, Whitemead, Mill Hill (joint managing director). Qualification : £250. Remuneration of managing directors as fixed by the board. Secretary: C. S. Downing. The registered office is at Shenley Road, Elstree, Herts.

In a circular letter to the trade Messrs. Wellington and Ward inform their customers that they have registered their firm as a private company for personal reasons. Moreover, the change is the outcome of the steady growth of the business, the control and further expansion of which will be facilitated by its incorporation. There will be no change in the policy, and the direction of the business will remain as in the past. Mr. H. W. Hall will be Chairman of the Board and Managing Director. Mr. J. B. B. Wellington, as Director on the scientific side, will fully maintain his connection with the business, and Mr. H. H. Ward will continue his present functions as Engineering Director. Mr. C. S. Downing, for many years Manager of the firm, appropriately becomes joint Managing Director.

News and Notes.

Mr. H. H. Featherstone, F.R.P.S., who for the past thirteen years has been instructor in photography in the Catford Commercial Institute, has been appointed assistant editor of the "British Journal of Photography." Mr. Featherstone will take up his duties early in September next.

Dublin Photographs.—One of the first to visit the Four Courts after their surrender was Mr. G. Limbrey, of the Photo Press Agency, who secured a number of the photographs which have been reproduced in the Press. In the "Weekly Dispatch" of last Sunday, July 2, Mr. Limbrey gives a description of the typically Irish scenes of the surrender, and of his rapid retirement from an unexploded bomb.

Summer Snapshots.—The "Westminster Gazette" invites its readers to send in photographs containing as much news value and human interest as possible, and a prize of one guinea will be given every Tuesday and Friday (to September 29) for what is regarded as the best photograph on these days each week. In addition, the Editor reserves to himself the right to use any photograph on any day, and will pay a fee of 10s. 6d. for each one used. At the end of the season a prize of a handsome Kodak camera and materials to the value of 20 guineas, to be selected by the prize-winner, will be awarded to the competitor who has, in the opinion of the Editor, sent in the three best pictures. All photographs should be addressed to the Photo. Editor, "Westminster Gazette," 104, Shoe Lane, E.C.4, and should be carefully packed.

British Photo-Base Paper.—At the annual general meeting of Wiggins, Teape & Co. (1919), Ltd., held on June 29 last, the Chairman, Mr. P. W. Holden, referred to the progress made by the company in the manufacture of photographic base paper. It was a new trade for this country—a highly technical and scientific trade, and one which had many sides to it. They had now got a mill in all essential features admirably suitable for the manufacture of this paper. Some grades that they were making were giving complete satisfaction to their customers—grades which they could not make at the old mill, and which formerly came from abroad. Other grades had yet to be improved, but the company had running orders in hand which they were able to execute at a profit, and he could speak hopefully of the prospects of this branch. Shareholders would realise that the photographic trade had suffered, like most other trades, from the general depression —especially the professional trade—but, on the other hand, he believed that photography as applied to advertising was only in its infancy. Much of their base was used for that purpose, and he had great faith in the future.

Irish Salon of Photography.—We hope that events in Ireland will allow of the holding, as is proposed, of the First Irish Salon of Photography, in the Metropolitan School of Art, Dublin, from August 14 to 25, this year. The salon will comprise three classes : the first, A, open to residents in Ireland and Irish photographers overseas; the second, B, open to all amateurs and professionals at home and abroad; and the third, C, open to professional photographers resident in Ireland. Classes A and B are divided into seven sections : (1) Landscape, seascape, genre, architecture; (2) Portraits and figure studies; (3) Nature pictures; (4) Scientific and technical; (5) Monochrome slides; (6) Colour photography; and (7) High speed photography. An award of a silver cup or shield is offered in Classes A and B, and in each of the seven sections one award only will be made of a gold, silver, or bronze medal at the discretion of the judges. The entry fee is 5s., with an additional fee of 2s. 6d. for each print above six. The judges are Mr. Alfred Werner, F.R.P.S., Dr. Dermod O'Brien (President Royal Hibernian Academy), and Mr. J. A. C. Ruthven (Past President, Photo-

graphic Society of Ireland). Further particulars of the Exhibition and entry forms may be obtained from the Honorary Secretary, Mr. William Harding, Irish Salon of Photography, Metropolitan School of Art, Kildare Street, Dublin.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspnodents.*

VIEW-POSTCARDS.

To the Editors.

Gentlemen,—In the article on the above subject in your issue of June 23 last the writer is somewhat sanguine as to the possibilities of this work for the small professional photographer.

I venture to say that too much should not be expected from this source, and that in fact it would be very easy to come out of such an enterprise with a loss. I have made some experiments in this direction in my town and in the surrounding districts, and had I not been extremely cautious I should most assuredly have lost money.

Among other things I found that the best pictures, i.e., those which made the best compositions were not good sellers, the public, I was told by the retailers, liked a well-known view, and a commonplace one at that, far better than a composition which they would admit readily was very "nice" but did not buy.

Then I set out *to* give them the "usual thing": these went fairly well at first: then I was up against the big firms.

These firms are really the great trouble and it is almost hopeless to attempt to compete against them as apart from ordinary competition they appear to periodically unload surplus stocks on the retailers at ridiculous prices. This they can do with their large selling organisations in one day over a large district and the unfortunate photographer will find his customers loaded up with stuff that they have been tempted to buy at a cheap price.

The result is that where one has every reason to expect orders for several gross, only a few are ordered, and in some cases none at all, which means that the time spent on calling is frequently not paid for. This is the fact which I know from personal experience, and although I have not given up the work entirely, I do but very little and only when I am sure of placing the results.

You will, I am sure, not object to my sending this little résumé of my experiences, and perhaps you will agree with me that a word of caution is due to those of your readers who may be inclined to risk capital *on* a branch of protography which is now unfortunately in the hands of capitalists.

Mr. Denton does, in his article, advocate leaving the town alone, but suggests that in smaller centres there is scope, and mentions the case of a man, who could not get supplies of a particular view without difficulty. That man I have met and taken endless trouble to get what he required, usually from an impossible position where the light was always difficult, when done perhaps he will give you an order for three dozen.

No, those who look to postcard work on a small scale for a profitable outlet for their energies will, I am agraid, be disappointed.—

Yours faithfully,
E. S. TARBREW.

Lansdowne Road,
Croydon,
June, 28.

PHOTOGRAPHIC BUSINESS IN JAPAN.

To the Editors.

Gentlemen,—We have read with interest the letter in your issue of June 30, by "Britisher," headed "Photographic Business in Japan," and we think the thanks of the photographic trade are due to this gentleman for his letter.

It is quite true that since 1919 there has been a very steady increase in imports of British photographic apparatus to Japan, and we ourselves have, during the last two or three years, shipped to that country considerable quantities of cameras, particularly of the higher class. There is little doubt that during the past twelve months the Germans are once more securing a strong foothold with their cameras and lenses which we think is due entirely to the depreciation of their currency and the consequent low prices at which they are able to sell their goods, and our sales have fallen off considerably.

With regard to the Tokyo Peace Exhibition we ourselves have sent out a fine exhibition of our goods to one of the leading wholesale houses in Tokyo, and this house is exhibiting it on our behalf.

As regards sending goods to the various "direct importers," we quite agree with "Britisher" that it is a very dangerous thing to do unless the orders are accompanied by a confirmed letter of credit against which cash can be drawn from one of the London banks, and we would strongly advise anyone shipping to Japan except to the wholesale houses who are well known to them, to refuse any orders that are not accompanied by such letters of credit.

We have one case in mind of a firm who wrote to us sending small orders, giving us references to the leading manufacturers over here, and stating that they were getting goods from them on the terms of thirty days' sight documents on payment. This firm sent us three or four small orders which we executed on these terms, and the drafts were duly honoured and the goods taken delivery of. They then sent us a further larger order, which we executed on the same terms—namely, thirty days' sight documents on payment. On arrival of the goods the draft was not paid, but, fortunately, as we had consigned them to one of the banks in Japan, the customer was unable to get delivery of the goods. Nevertheless, we have all the attendant expenses incurred for duty, bank charges, etc., besides which there are the expenses of freight out and home on the goods.

We certainly agree with "Britisher" in his remarks that unless the importers are well known to suppliers, goods should only be sent when orders are accompanied by the letter of credit as mentioned above.—Yours faithfully,

HOUGHTONS, LTD.,
F. M. ISAACS,
Director.

High Holborn, London, W.C.2.
June 30

SYSTEM IN HALF-TONE OPERATING.

To the Editors.

Gentlemen,—Replying to Mr. Sukamar Ray's letter, I have carefully re-read the extract referred to by me on April 28, and I am unable to agree that I have misread it. There is not a word about the screen distance being below the normal, although the diagram suggests that it is so. The author distinctly states that "In the great majority of cases we actually increase the nucleus of the dot by reducing the size of the stop," and the footnote explains that the exceptions are cases where large stops are used with a screen distance *greater* than the normal, and where small stops are used and diffraction effects are prominent.

I stated that I did not agree with Mr. Ray's conclusions for the reason that I cannot find anything in practice that agrees with the geometrical projection used by him. On page 36 of the same article the author says "the gradation with a single stop is very feeble." His conclusions in this respect are explained by the missing factor in the normal equation, the screen distances being always too great for the stops used.

I am sorry to appear to criticise Mr. Ray's work of twenty-five years or so ago which was, and is, of the greatest possible value, and all I can hope to do is to supplement it and make it more complete.

With regard to obtaining similar gradation with coarse and fine rulings, this must not be taken in a strictly literal sense, as it is quite obvious that a coarse screen must have a longer contrast scale than a fine screen owing to the greater distance between the dot centres. Such gradation can be obtained as the copy or class of printing demands, the contrast scale being strictly under control and with one stop

I agree with Mr. S. Ray as to the advantage of some simple method of measuring the total scale of an original, and I believe that an instrument has been worked out by Mr. C. H. Sharp, but I have no personal knowledge of it. At the present time our copies are graded into five classes judged by experience only as to tone scale and colour and, although this method leaves chances for error, it works out very well in practice.—Yours faithfully,

E. A. Bierman, F.R.P.S.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

H. C.—Three-ply wood of about 3/16ths thickness is used for statuette photographs. For small quantities go to Messrs. Hobbies, Ltd., East Dereham, Norfolk, or their agents in Blackpool, Messrs. the Blackpool Cycle Co., 193, Church Street, Blackpool. An article, giving full instructions, appeared in the "B.J.," October 10, 1913, obtainable from our publishers, price 5d., post free. Messrs. Campbell Gray, Ltd., 88, Edgware Road, London, W., make these statuettes from photographers' negatives.

G. F. D.—We have referred your query of June 27 to Mr. Ermen, who replies as follows:—The Monomet caustic developer should not be discoloured when it is made, even if the Monomet itself is somewhat old or discoloured, unless it contains an excess of caustic soda or a deficiency of sulphite, due to the use of inferior metabisulphite. Metol may be used instead of an equal weight of Monomet, but the preparation is more difficult, owing to the low melting point of the metol base. The metol "rodinal" offers no advantage either in point of stability or efficiency as a developer.

S. S.—We expect the stops are marked upon the Dallmeyer system, in which case the aperture marked 18 is approximately $f/13$. The others will then be as follows:—25, $f/15.8$; 36, $f/19$; 50, $f/22.4$; 72, $f/26$. You will understand this is guess-work, because the lens may perhaps be marked on another system, but, as it is apparently a wide angle, the maximum aperture is probably about $f/14$. Of course, you could easily ascertain the F numbers experimentally by measuring each stop with a wedge-shaped strip of card, successively dividing the focal length of the lens by each of the diameters thus found. The result will be the F numbers.

G. Y.—(1) We do not advise you to do more than to rub the surface of the enlargement with stale breadcrumbs. Take the crumb of a loaf two or three days old and break it up until the grains are as small as rice. Cover the print with these, and gently rub with the flat of the hand. When the crumbs become dirty, throw away and use fresh. Any marks which resist this may be removed with soft rubber, not eraser. (2) First give your calico a coating of size or cooked starch. When dry, use any good plain distemper. "Kalko" background paint, which you can get from the Vanguard Co., Maidenhead, or any dealer, is easily mixed and applied.

D. V. E. (1)—Cold weather certainly makes the blind of the focal-plane shutter a little stiff and therefore slows the shutter, but in such moderate climates as that of the United Kingdom we do not think it is a material objection. If the shutter is worked a few times in a warm place before taking it out of a day it works freely enough even in the winter. But apart from this the speeds marked on focal-plane shutters are almost as much at variance with the actual speeds as those on between-lens shutters. (2) One can only give a general opinion, but a well-designed and made shutter ought to work reliably without need of repair at any rate for one year or two.

B. W.—We think it will be difficult in any single negative to get the title to print in black on the white ground, whilst at the same time getting a good reproduction of the tones of the photograph. If you can develop the negative of the photograph so that the surround is dense enough to print white on the print, could you not take a separate negative of the titles on a process plate and add this to the main negative, as is done in printing titles on view postcards—that is to say, stripping the title on to the main negative from a plate negative? We do not think that printing the titles in any other colour would help matters. The use of a slow panchromatic plate in conjunction with a light-filter might perhaps serve to get over the difficulty.

B. W. G.—With the 8-inch lens you would be able to manage very well with the window alone for heads and sitting figures, but you would have to bring the sitter too far away for full lengths, for which you would require artificial light. If you can possibly get electric current, you would do well to instal a couple of 1,500-c.p. half-watt lamps, which would be better than the best gas light, and, we should say, would not cost more to run. If you must use gas, Griffin's "Howellite" lamp is a good model. You could probably obtain a lamp second-hand by advertising. For this light you would require the most rapid plates, and these must be isochromatic. The drawback to gas is the great heat which is generated in the room.

C. Swift.—It is a very old idea to mix albumen with gum in the coating for the gum-bichromate process. We quote a formula, etc., which is not substantially different from yours:—

Bichromate (solution A)	1 oz.
Gum arabic, finely powdered	½ oz.
Albumen, white of egg, beaten up	2 drs.
Glycerine	½ dr.
Pigment	as necessary.

The solution A is made by adding ammonia to a cold saturated solution of potass. bichromate until the mixture turns red litmus paper faintly blue. In preparing the sensitive mixture, the solution A is warmed, the powdered gum and glycerine added in small doses, then the albumen, and finally the pigment, which is mixed with a spoon or spatula. The mixture should be about as thick as honey, and should be coated thin enough to allow the lettering on a piece of printed paper to show through. The coated paper should appear glossy when dry. If it is matt, there is too little gum. Too much albumen lowers the sensitiveness.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3245. Vol. LXIX. FRIDAY, JULY 14, 1922. Price Fourpence.

Contents.

SUMMARY.

A paper by F. M. Walters, jun., and R. Davis has recently been published by the Bureau of Standards, Washington, recording a detailed study of the use of the chief sensitising dyes for the colour sensitising of plates by bathing. The method of testing is described and working details given of the use of pinacyanol and other colour sensitisers. (P. 416.)

In his "Paris Notes," M. L. P. Clerc refers to some of the commercial and educational applications of cinematography which are taking place in France, and also to current events in colour photography. (P. 413.)

In a contributed article, Mr. R. R. Rawkins refers to the advantages of the extra-contrasty grades of bromide paper for dealing with the quantity printing from amateur film negatives. (P. 411.)

By the use of the selenium single-solution sepia toner in conjunction with Farmer's reducer, a German experimenter has obtained two-colour effects (double toning) on development papers. (P. 419.)

A particular fluoride salt, known as acid ammonium fluoride, is recommended for the removal of the gelatine films from old negatives. The films may be removed whole, leaving the glass clean. Nevertheless, we utter a caution against much immersion of the fingers in such a solution. (P. 410.)

An article by "Thermit" records experience in the use of tanks and other accessories of metal in the use of photographic solutions, and incidently describes how to make a clip for the handling of film bands in the developer. (P. 412.)

Mr. E. A. Bierman outlines the experiments by which he has been led to include the diffraction phenomenon in the calculations relating to diaphragm aperture and screen distance in half-tone negative making. (P. 415.)

In a leading article we refer to some of the forms of damage which a lens may sustain, such as scratches, chips, and other markings, injury to the cementing and strain due to shock from a fall or blow. In some cases the damage may be ignored; in others the expert skill of the optician, preferably the maker of the lens, is required. (P. 410.)

Next year's Photographic Convention is to be held at York. (P. 423.)

A non-focal-plane reflex camera and a cinematograph projection lens of greater efficiency are among the patents of the week. (P. 420.)

Inks containing wax have been recommended as a means of producing oil prints of matt surface. (P. 410.)

In copying sepia-toned prints a colour-sensitive plate is practically a necessity; a light-filter used in conjunction with it is often an advantage. (P. 410.)

EX CATHEDRA.

Turnover and Profits. When negotiating for the purchase of a business, the prospective buyer will do well to ignore the amount of the gross takings, and to ascertain very clearly what the net profits amount to, or, more accurately, what he may expect to draw in return for his own labour and interest on capital. Many photographers are quite satisfied with a business which pays them a decent operator's wage, plus interest on capital invested, there being no "profit" in the sense in which an accountant would use the word. It must always be borne in mind that there are certain standing expenses, such as rent, rates and taxes, upkeep of premises, and, except in very small businesses, wages which have to be met. Outlay on materials is in proportion to the business done, and is much greater in proportion in a cheap business than where good prices are obtained. What has to be done is to get down to net profit for the last two years, and upon that judge the value of the business. In a case recently investigated the profits were about forty shillings weekly, yet several hundreds were asked for a very scanty equipment and a short lease of premises which were not too cheaply rented.

* * *

Warm Black or Sepia. There is a decided tendency at the present time to discard the sepia tone and make prints of a warm black colour. This, to our mind, is a move in the right direction, since some of the sepia tones are far from beautiful. We have seen prints recently on exhibition in show cases, which were of a decidedly yellowish tone, giving the impression of a faded or washed-out image. This result cannot please the customer; while a rich, warm, black tone would be appreciated. Many people have an inkling of photography nowadays, and are often liable to blame the maker rather than the process. The varieties of paper now available for warm black tones by development are legion, and it is decidedly easier to get one's colour by a single process than to use a messy bleacher and the objectionable sulphide bath. We all appreciate the elimination of the latter, on account of its penetrating odour, and also of its deleterious effect upon plates and papers stored in or near the workroom. We traced an instance of stained bromide prints recently to the effect of sulphuretted hydrogen given off during toning. The paper was kept in a separate room, quite away from the toning baths, and was in gross boxes. It was found that brown stains always appeared upon the uppermost sheets in any box that had been opened. The true warm black tone approximates in its gradation more closely than any other print to a good platinotype, and, after all, it is the platinum quality we strive after, whether we admit it or not. As to developers, we find that the borax metol-hydroquinone formula gives slightly warm black tones, full of life and sparkle, on almost all the best makes of

bromide papers, not necessarily those expressly made for warm black tones.

* * *

Matt Oil Prints. The objection which is often raised on æsthetic grounds against the characteristic glossiness of oil pigment prints, leads one of the prominent exponents in Germany, Herr Wurm-Reithmayer, to review the methods which may be used for obtaining oil prints of matt surface. The use of solvents of the varnish constituent of the ink is put aside as difficult and by no means satisfactory, quite apart from the danger involved in the use of such an inflammable liquid as benzene or ether. The writer recalls the use for pigmenting oil prints of the Rafælli pencils as employed by painters in oils. Pigmenting with these yielded prints of agreeable matt surface; and their composition then led Herr Wurm-Reithmayer to try the effect of pigmenting with an ink containing a considerable portion of wax. By making up a mixture compounded from beeswax and ordinary typographic ink it was found that the prints pigmented with it yielded a completely matt surface. It is not suggested that the production of a matt surface by an ink containing wax is a new discovery, since wax is commonly added to ink for the proofing of engravings when a matt effect is required. But the author emphasises the convenience and greater cleanliness of a wax ink, and expresses the view that makers of requisites for oil printing might well place such inks upon the market.

* * *

Copying Toned Bromides. A sepia-toned bromide print, especially if it be vigorous, is by no means an easy subject to copy, and there are probably few photographers who get the best possible result. This is due mainly to disregarding the non-actinic colour of the image which necessitates not only a long exposure but also demands the use of a colour-sensitive plate. It might be thought that with a monochromatic original, a sufficiently prolonged exposure would give full details, but a little thought will show that if a deep yellow half-tone is sufficient to prevent any action upon the emulsion, any darker details, although clearly visible to the eye, must necessarily be lost. A colour screen, although not indispensable, is beneficial; even if there are no apparent blue or violet rays visible, yet they exist in the light reflected from the surface of the paper independently of that coming from the actual image. This is shown to perfection when copying an old varnished painting, where the screen cuts out all superficial light and gives true value to the pigments.

* * *

Cleaning Films from Negatives. On the commercial scale the films are usually cleaned from old negatives by dipping for a few seconds in a hot solution of caustic soda or potash, by which the film is so softened and disintegrated that it can be quickly cleaned off completely with a stiff brush. The method is open to the objection that with some qualities of glass and also, as appears to be the case, with negatives which have been treated with alum, the glass is left in a slightly opalescent state and, therefore, is useless for the purpose to which such waste negatives are usually put, namely, in the various photograph frames sold by stationers. In a recent issue of "Photographische Rundschau" a different process is very strongly recommended. It consists in the use of a cold solution of acid ammonium fluoride of 1 to 2 per cent. strength. A stronger solution is found to exert a certain matting effect on the glass, but in a solution of the above strength the gelatine film becomes partly detached within a few seconds and can be removed whole, leaving the glass perfectly clean. We should not be inclined to recommend continuous immersion of the hands in such a solution, but no doubt on the quantity scale plates could be immersed in the solution in racks and given a rinse in plain water before removing the films. In this way contact of the fingers with the fluoride solution could be almost entirely avoided, and that, we think, is very necessary if the danger of serious skin affection is to be eliminated. Apparently, a very little of the fluoride goes a long way; it is stated that 7 ozs. of the solution serve for clearing the films from 150 to 200 quarter-plate negatives.

DAMAGED LENSES.

A PHOTOGRAPHIC lens, if treated with reasonable care, should remain in good condition for many years; in fact, more than an average lifetime. Many lenses bearing the name of Andrew Ross, who died in 1859, are still in daily use, and are in good working order. Some of the more modern lenses, owing to the use of unreliable glass during the period of experimentation in anastigmatic construction, show signs of surface tarnish, but, fortunately, these are comparatively few in number.

Yet there are many ways in which a lens can be ill-treated; in some cases the damage is irreparable; in others it can be more or less repaired and the instrument restored to its original usefulness. It is not recommended that any considerable trouble or expense be incurred with lenses of little value, as such can usually be replaced at less than the cost of repair, but good lenses, especially if of large size, are well worth attention.

While the amateur optician may effect certain improvements in the metal work of a lens, he is strongly advised never to meddle with the glass components, for he will probably find that after passing through his hands, the last state of his lens is worse than the first. All such work should be entrusted to a skilled optician, and if the original maker is still in business, to him alone should the lens be sent. Serious repairs are apt to be somewhat costly, but as a rule money so spent is well invested; even if the cost of replacing a damaged combination is half the original cost of the lens, it is cheaper than buying a new instrument. It must be realised that only the maker knows the exact quality of glass used for any particular batch of lenses, and the curves to which it was ground.

The most common injury to lenses consists of a general dulling or de-polishing of the exterior surfaces, or more or less distinct scratches or "digs," the latter being usually due to allowing the lens to knock about without protection in the camera case. The former trouble, though not so unsightly, is the more serious one of the two; if it exists it is impossible to obtain bright negatives, the diffusion of light from the dulled surface degrading all the shadows and often creating a false impression of over-exposure. This condition may or may not be easy to remove; in many cases, an application of the polishing tool and putty powder restores the original surface. Scratches are less easily dealt with. As they penetrate a certain distance into the glass, the surface has to be entirely re-ground and polished, which not only reduces the thickness (often an important factor), but alters the figure or curve. It may be necessary to explain that it is usual to grind a lens of slightly larger diameter than its ultimate size, and then to "edge" down the imperfect margins. Obviously, this cannot be done with a finished lens, so that it is often necessary to cover the margin of a re-worked lens with a narrow metal ring which, while slightly reducing its rapidity, ensures perfect

definition. But the scratches may be merely an eyesore, and do not appreciably interfere with the performance of the lens. If they are small, they may be ignored, but if wide and deep it is advisable to rub a little black varnish or printing ink into them, so that they appear as black lines upon the surface instead of white ones. No traces of the black pigment must be allowed to remain except in the scratches. There is no danger of the scratches, when filled, affecting the negative. It may not be generally known that if a shilling be cemented on the centre of the front of a large lens, say, three inches in diameter, and an exposure made at full aperture, no sign of its presence can be found upon a negative. It is only when the size of the diaphragm aperture approaches that of the obstruction that it becomes visible, and such a condition cannot exist in the case of a scratch.

Conchoidal or "oyster-shell" chips sometimes occur on the edges of lenses. If ignored, these will cause a general fogging, but when painted out with black varnish become innocuous. Even a lens broken across the centre may be cemented together with black varnish and be made perfectly usable. If a transparent cement, such as Canada balsam, were used, there would still be a sufficient difference in refraction to cause a scattering of light.

Very often an injury to the cementing between the components of a lens is mistaken for a crack or chip. As a rule, if prismatic colours are present, this is the case, and the trouble can easily be removed by re-cementing, which can be done by anyone used to the work. It may be as well to state that the Canada balsam, as used by opticians, is very different in consistency from that used by microscopists or for cementing colour filters, being a hard resin, liquid only at a high temperature and not a varnish-like liquid. A fair amount of skill and access to proper appliances is necessary if the contact is to be perfect and the glasses properly centred.

Lenses frequently receive injuries from falls, blows and other shocks which are not apparent to the eye, but seriously impair the definition. Glass is not the rigid, unyielding substance it is generally supposed to be, and when the brass mounting of a lens is bent or distorted, the strain which is put upon the glass upsets all the optician's calculations, and may turn the finest anastigmat into a "soft focus objective." It is therefore wise to test thoroughly any lens which has had a fall or any bad strain before using it upon an outdoor job. The condition produced is fortunately only temporary, and making a new cell or re-turning the old one is all that is necessary.

Nearly all the ills that lenses are heirs to may be avoided by providing them with cases in which they can be kept when not actually upon the camera. If this be not done, at least a well-fitting cap should be provided for both back and front cells. Rust or tarnish upon the surfaces, unless very bad, should be ignored; above all, no attempt to polish it off by hand should be made. It may make the lens slightly slower, but now ortho-chromatic plates are in general use, this will hardly be appreciable. Lenses showing any trace of this defect should be kept in an airtight case in as dry a place as possible.

BROMIDE PAPER FOR D. AND P. WORK.

Many portrait photographers are now undertaking developing and printing for amateurs, as a "side-line" in most cases, but I heard recently that it bids fair in some instances to oust the principal line in activity and remuneration. One photographer told me that his newly-formed "D. and P." department proved a veritable godsend to him, and to others who find portrait work slack and money "tight."

From a considerable experience of amateurs' fads and fancies, I find that a large number of "button-pressers" prefer to send their films to a professional photographer who undertakes this class of work. They argue that it is his trade and they can rely upon perfect technical work, whereas the local chemist may relegate the job to a junior assistant to do in his spare time. Some years ago there was undoubtedly much slackness in this direction, but at the present time most chemists have properly organised departments for D. and P. work, whilst some put the work out to reliable trade houses; still, the fact remains that the average amateur feels safer in entrusting his work to a professional photographer.

The introduction of slow development papers of the gaslight type necessitated a change in the exposing apparatus, and most photographers are now in a position to print on gaslight papers. As the bulk of amateurs' negatives are under-exposed, it is necessary to print them on a vigorous grade of paper, and printers were not slow in taking advantage of the "cast-iron" gaslight paper, but nowadays there arises the inevitable questions of speed of production and cost of working.

High-power electric lamps are expensive; they use up a lot of current, and the exposures on gaslight paper from some negatives may be unduly long. The chief reason why the vigorous gaslight papers are so much used is the ease with which brilliant prints can be obtained from poor negatives, but there are now several makers who market bromide papers that will give all the contrast that gaslight will give. Extra-Contrasty, Extra-Vigorous and Extra-Hard are some of the names given to these grades.

There is certainly a good deal to be said in favour of bromide for D. and P. work now that there is a grade for "ghosts." It is a curious thing, but when a customer orders enlargements from certain of his films it is invariably found that these are the poorest of the lot from a quality point of view. Here then is the opportunity to use this extra-vigorous bromide paper. Press photographers have for years used a hard paper made specially for the production of brilliant prints from their high-speed exposures, but the manufacturers have lately given us papers of still greater contrasts. The speed is about one-half that of ordinary bromide paper, and any of the usual developers can be used.

For brevity's sake I enumerate below the principal advantages of bromide paper over gaslight paper for D. and P. work:—

1. There is a saving in the light bill.
2. The printing box is cooler and the films less inclined to curl.
3. Little or no tendency to greenish blacks by over-exposure or to very blue colours by under-exposure.
4. No tendency to stain suddenly if left in the developer a trifle longer than usual.
5. Will stand handling, and not so liable to deteriorate in an impure atmosphere.
6. Will tone well in the sulphide bath.
7. Will give nice tones in the hypo-alum bath provided the prints receive about one-third more than the usual exposure and are developed in a restrained developer.

R. R. Rawkins.

DARK-ROOM METAL WARE.

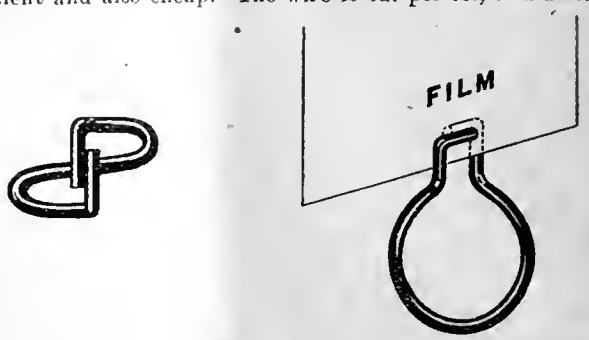
The problem of metal-ware, in its relation to plates, film, papers and photographic chemicals, is one which sometimes gives the photographer serious food for thought. I am not going to solve the problem, or even attempt to analyse it scientifically, but having had a rather extensive experience of dark-room metal-ware, I may be able to give a few hints that will help the practical man.

Metal implements used in photography have their principal significance through their possible and probable reactions with developing and fixing solutions. If it were not for these reactions, any old metal might be used with impunity for the construction of racks, tanks, dishes, etc. As it is, the most innocuous metallic compositions yet devised cannot be considered foolproof.

If an implement comes into contact with developer only, my experience is that most metals are quite safe while clean, but they must be scrupulously clean. If the same tank, rack or rod goes also into contact with the fixing, the problem is first extended but may be ultimately simplified. Simplified, if the metal used is one of the usual alloys, though it might not be so with every pure metal. The extension of the problem is due to the fact that fixing baths, and particularly the modern acid fixing baths, will attack many metals which are safe in developer; the simplification is due to the ultimate silver plating done by the same baths.

My first experience of using metal implements for developing aids, was with a type of rack which is still obtainable from Messrs. Kodak, Butchers, and David Allan. This rack appears to be made of nickel-plated copper, and carries from whole-plate downwards, small plates being accommodated by means of a movable partition. It is provided with hooks and can be hung in any deep tank or washer, the ability to deal with huge quantities of mixed-size plates being a marked feature of the type, as any number of racks can be hung one under the other, provided the tank is deep enough. I have used one of these racks constantly for three years without a stained negative, but I believe there is a lot in the way the rack is handled. I load it with one plate only to each groove, and do not disturb the plates again until they are *dry*. That is to say, the rack goes through the developer, washer, fixer, washer, and is dried without being touched by brush or cloth. I have known the same type of rack to be overloaded—in the interests of economy—two plates being forced into each groove. The result was a batch of metal-stained negatives due to the scratched surface of the grooves, and in a very short time the same rack fell to bits. I have also known stains when such a rack has been assiduously scrubbed, the scrubbing taking off the original plating and any subsequent silver coating also. My own racks at the moment are white with silver from the fixing baths, and are consequently quite innocuous. What I have said about racks also applies to tanks, but I think the rack is easier kept clean. I do not use metal tanks now, and if I did I would prefer to have separate tanks for each solution.

Photographers who handle quantities of amateurs' films require rods to suspend them in the tanks. These rods are usually metal. Why, I don't know. I would prefer vulcanite or something like that if I could get it, and I have thought of glass, but decided not to risk it with dark-room hands. The orthodox rod is costly—or was when I bought any last—and it is up to the photographer who likes investigating things to try substitutes. I tried copper wire. It worked very cleanly, soon putting on a nice coat of silver from the fixing, but it was not strong enough. Various other things were tried, with the result that I finished up with tinned iron wire of a thickness of about $\frac{1}{8}$ in. I do not know the technical gauge, but the wire will bend to any desired shape, is strong and lasting, and has sufficient spring to make film clips as well. This wire has worked well for a long time, the only thing about it being that it is likely to rust if the plating is scratched, and rust is mischievous. The following system answers to prevent trouble. Every day, before any rods or clips are used, they are all gone over with a stiff brush. This leaves them free from any traces of rust or any other foreign matter. When put into action, they go right through the whole gamut, and when released from the spools are merely thrown into a wire box to dry. They have no apparent action on the solutions, or their activity, though I remember some years ago getting a batch of purple negatives from a wooden tank into which some tinned iron wire had been dropped accidentally. In that case, the wire had lain for some time before the colouring appeared, and in spite of the stain the negatives were beautiful printers. Standard film clips are, in my experience, usually to be relied on, but the wire ones I have mentioned are certainly efficient and also cheap. The wire is 6d. per lb., and 1 lb. will



make about 30. To make a clip of this kind, it is only necessary to cut about 8 ins. of wire, and bend it as shown in the sketch. The requisite amount of spring can easily be got by opening it out the wrong way, and forcing it back gently. This clip will firmly grip the two ends of a spool, and is quite heavy enough to sink the largest size single or double, while not too big for small sizes.

Pack film is the despair of many developing firms. There are some, in fact, who will not take orders for developing packs. But there is nothing very troublesome about packs if hangers are used in conjunction with the usual film tanks. Such hangers, in different types, are supplied by Kodak and Houghtons, and they are very efficient. I have also developed packs by threading them on thin twine and dropping down the tank without any weight. They must be released and hung separately to dry when this dodge is used.

A useful implement in the dark-room is a Hotchkiss paper punch. A large batch of spools can be virtually halved by punching them up in pairs, the little metal rivets being quite safe provided they are driven through the blank ends or edges of the spools. They can also be used to string up a pack into one long film, but great care must be taken in placing the rivets in this case.

With papers, metal does not figure to such an extent, but we have enamelled dishes and galvanised washers. The former get scratched, and the latter are subject to the action of traces of acid fixing. I have never noticed or suspected any bad results from an exposed patch of iron in an enamelled developing dish, but hypo, alum, or acid fixing baths have at times caused stains from this source. Galvanised washers appear to be quite all right when plain hypo is used, and also when hypo and metabisulphite are the sole constituents of the bath, but there is a doubt when we come to other acid baths. To test whether a washer is safe, take a print fresh from the fixer and place it in contact with the bottom of the washer. If no mark is caused on print or washer, things are in order,

or at least there is no obvious cause for alarm, but using acid baths, I have had deep brown and black stains on the washer by this test. Such marks would appear to be due to sulphurisation of the zinc surface of the bath, and such action is not what one would desire in contact with the face of a print. The technical details of what happens, and what might happen, I will leave to the research departments who are better equipped for such problems, but it appears to me to be a safe policy not to use acid baths in conjunction with galvanised washers. Using plain hypo, I have found galvanised circular basins, 18 ins. in circumference and 10 ins. deep to make excellent washers. Holes are bored or punched round the perimeter about 1 in. from the top, and the water enters from a hose in the centre and 1 in from the bottom. The prints do not lie in a heap, and are reasonably hypo free with a relatively small amount of water. Such basins can be picked up from surplus Government stock at nominal prices.

Concluding, I might mention some interesting tests I made with stainless steel, samples of which were supplied by the manufacturers. I found this metal resisted developers well, but immediately turned ebony black on immersion in an acid fixing bath. The safety and durability of this black plating I was unable to determine, but I hope some day to try this metal again. Some deleterious action took place with the fixing, but it is possible that this would cease when the change in the metal's surface had reached a certain point. This is another item I will recommend to the research people as possibly worth investigation. THERMIT.

PARIS NOTES.

THERE have been quite a number of signs of renewed photographic activity in Paris since my last letter. These, in the order of their occurrence, are the exhibition of the French Physical Society, an exhibition of cinematography applied to scholastic purposes, the Paris Fair, the re-opening of the Salon du Gout Francais and a very interesting exhibition of his pictorial works by Commandant Puyo.

Scientific Photography.

At the exhibition of the Physical Society M. Prélhumeau showed his apparatus for stereo-photo-topography already described in these notes (B.J., March 19, 1922, p. 295). The well-known instrument maker, M. A. Jobin showed the microphotometer of Fabry and Buisson for the measurement of densities in photographic negatives, especially for the study of the distribution of light in spectral rays; also a universal photometer by the same designers for measuring stellar negatives or negatives to be used in photo-topography. M. E. Bouty, a maker of astronomical instruments, exhibited a new model of machine for the measurement of multiple movements with great exactitude. Lastly, MM. H. Calmels showed some new grating replicas of large size cast from an original Roland grating by a Parisian astronomer. M. E. Annequin, for the construction of spectrographic cameras used in the examination of light-filters and in measurements of the colour-sensitiveness of emulsions. In addition to these scientific instruments, the exhibition included Eastman Duplitized X-ray film, Wratten light-filters, Guilleminot plates and papers and stereoscopic cameras of Jules Richard.

Cinematography and Projection.

For some months past there has been a very active propaganda in France for the wider use of the cinematograph in schools of all degrees and particularly in those for young children. The movement has already borne fruit, for several municipalities have acquired cinematograph outfits for use in schools. The town of St. Etienne (Loire) has provided each of its schools with a cinematograph projection outfit. Films for these purposes are obtainable on free loan from a department of the Ministry of Public Instruction, which for many years past has circulated collections of ordinary lantern slides throughout France. Not only is the loan of these films made without charge, but the films are sent here and there gratuitously by the postal service. At present the stock of cinematograph films is not a very comprehensive one, but the work of making it such is being actively pushed forward by producers with the assistance of several publishers of school books and medical and scientific works.

An association in Paris which goes by the name of "L'Art à l'Ecole," and includes among its members some artists and people interested in juvenile training, has recently held a congress for determining the lines which should be followed in the production of films for use in schools, in which work it has received the support of public authorities and the municipality of Paris. The congress was made the occasion of an exhibition on the premises of the Conservatoire National des Arts et Metiers of types of cinematograph projector and accessories most suitable for use in schools of various degrees from those for the youngest children to the universities. Simple and strong projectors were shown, in particular by MM. Aubert, Gaumont, Mollier and Pathé; also some machines of extremely simple construction, among them some home cinematographs shown by three firms, the Cinoscope Co. and M. Milior and M. Laval.

The same machines were included some short time afterwards in the Paris Fair with the addition of some additional models. One of these, the "Lumicycle" of MM. Gaumont, is a cinematograph projector for school use in which the current for the electric lamp is supplied by a small generator which is driven by a wheel operated like an ordinary bicycle. Students take turn in mounting a saddle and working the pair of pedals which generates the light for the projection. MM. Pathé-Cinema showed a miniature Baby projector and a cinematograph camera for amateurs, both using film of less than standard size, i.e. of width just under 1 in.

An interesting new introduction is the "Business Cinevalise" of MM. Mollier, a cinematograph projector completely enclosed in a container of the form of a suit-case. By connecting an electric terminal to the holder of any electric lamp, this miniature apparatus allows a commercial traveller to show projections of his goods to customers whom he visits. Film of standard width is used, and a projected picture of about 9 x 7 in. size is shown on a translucent screen which is shielded from external light by dark curtains. The motion pictures can thus be exhibited almost anywhere.

At a stand in the Paris Fair an exhibitor of the "Orthotrope" concave projection screen sought in vain to convince visitors that the image projected on this screen gave a relief effect. At the same exhibition a stand of the Department of Scientific and Industrial Research and Inventions (a branch of the Ministry of Public Instruction) had been converted into a projection theatre for the demonstration of stereoscopic projection by polarised light re-invented by M. P. Toulon. The process in no wise differs from that patented and practised in 1891 by John Anderton of Birmingham (B. J. Lantern Record, 1892, Oct. p. 6 and 1899, Jan. p. 6). It is a thousand pities that a state department should employ its funds for subsidising the re-invention of uncommercial processes or, as in the present case, of methods which have been known for years.

In the field of ordinary optical projection an exhibit at the Paris Fair was the Silf outfit, in which the transparencies, to the average number of 25, are supplied on a band of film. There was also shown the automatic Pircus projector of M. G.

Massiot, designed for luminous advertisements, in which views are arranged radially in a cylindrical basket and are caused to come successively into the lantern stage.

The same constructor shows two further models of optical lantern, one designed particularly for the higher grades of school and serving for either cinematograph or still projection, the latter of ordinary lantern slides, solid objects, and also objects arranged horizontally on a glass plate or in a transparent dish of water, or of microscopic preparations. The other lantern is constructed for the projection of Autochromes and other colour transparencies, and at a distance of 18 ft. gives a very bright image at a magnification of about 16 times. The light-source is an incandescent lamp consuming 2.5 amperes at 110 volts. Two of these lanterns can be used together for the production of dissolving views. A rheostat allows of the light in one being gradually lowered whilst that in the other is brought to full power.

I must also mention the production by the firm of Bauchet of a new non-flam cinematograph film in which the picture is formed in the interior of a film of cellophane and not, as has hitherto been the case, on the outside surface of the support. The film is at present made only in less than the standard size for use in home cinematographs, but it is intended to produce it in the normal size.

High-Speed Photo-Analysis of Movement.

Chrono-photography of ultra-high frequency for the analysis of extremely rapid movement has been hitherto attempted by means of rotating mirrors, serving to record the successive phases of a moving object. Since 1904 M. Lucien Bull, the successor of Marey, inspired by the results obtained by Marey, Mach, Boys, and Wood respectively in 1879, 1885, 1890, and 1903, has used electric sparks in rapid succession as the source of light. The moving object, which may be an insect or a projectile, moves in front of a condenser by which the image of the spark is projected on to the lens. The duration of each period of illumination is so short that whatever the speed of the moving object or of the displacement of the sensitive film, the image is formed with critical sharpness. In these first experiments the frequency of the sparks was regulated by the contacts of a rotating electrical interrupter, similar to the collector of a dynamo, mounted on the same spindle as the drum (about 3 ft. in circumference) to which the sensitive film was attached. In this way from 50 to 60 photographs could be made with an interval of about 1-1,000th of a second between each pair. This first primitive device provided the means for numerous researches, and M. Bull has now improved it in many important respects as the result of his work during the war in the study of the movements of projectiles from small arms and from guns of very small bore. With the aid of MM. Abraham and Bloch he has been able to record up to 200 images on a rotating film of 3 ft. in length at a rate of 10,000 per second. The sparks obtained by the oscillating discharge between two aluminium hemispheres of a small condenser (itself supplied by a condenser of large capacity) have a frequency which is constant within 1 per cent. and is adjustable at will over a considerable range. The duration of the spark is about one five-millionth of a second and its actinic brilliancy about 160 times that of a 12 ampere arc, or 16 times that of the sun.

The only limit to the frequency with which the images can be recorded is that of separately recording the pictures on the film. It is scarcely possible to give to film mounted on a drum of 1 ft. diameter a peripheral speed of more than 165 ft. per second. Hence with a frequency of 10,000 images per second the height of each image cannot be greater than about one-fifth of an in. (5 mm.).

Without altering the electrical device, M. Bull has recently been able to go further as regards separating the images by rotating the photographic part of the apparatus. The film is arranged on the inside of a fixed cylindrical drum of 1 ft. diameter and receives the images formed by a lens, the axis of which coincides with the geometrical axis of the cylinder. The images are diverted to the film by means of a total reflection prism. The small weight of this prism allows of its receiving a speed of rotation of 160 revolutions per second, corresponding with a speed of displacement of the image on the film equal to 1,660 ft. per second. Thus, the images recorded on the film at a frequency of 40,000 per second are half an inch in height, or quarter-inch in height at 80,000 per second. The only drawback to this arrangement is that the images are turned on themselves at the same time that the prism traverses the circumference on which the film is mounted. For the cinematograph projection of a film thus obtained it would therefore be necessary to use an apparatus similar to that employed in taking the pictures, correcting the orientation of the successive images when printing on the positive film.

Colour Photography.

The Salon du Goût Français, after its successful season last year in Paris, has been warmly received on its travels in the United States, in New York, Philadelphia and Chicago, and has now been re-established at the Palais de Glace, Champs Elysées. This collection of nearly 2,000 Autochromes, most of them measuring 16 by 17 in., and of coloured transparencies, has aroused the greatest interest among manufacturers and merchants as well as in the minds of the public as regards the advertisement value of photography and particularly of colour photography. Most of the Autochromes are perfect examples of the process and many are of extremely difficult subjects. They are shown in panels of a handsome design which adds to their attractiveness. The exhibition, which remains open until the end of August, should most certainly be visited by any of my readers who are passing through Paris.

One of the notable portrait studios in Paris has recently been taken over by the Dufay Patents Company (originators of the Omnicolore plate no longer made) for the exploitation of a process of colour photography, the secret of which is being closely guarded. Specimens have been shown only to a very few people and even to them under the greatest secrecy.

Attempts have recently been made in France to negotiate the patents of Dr. A. Traube of Munich for the Uvachrome process, and a demonstration of this process has been given to the French Photographic Society by the Swiss company interested in its exploitation. The three negatives are made in rapid succession on a single plate by means of a repeating back which falls vertically between two successive exposures, its movement controlled by an air brake. The shutter release is connected to that of the repeating back so that their movements alternate without loss of time. It seems to be thought that the fact that the three exposures respectively through the three light-filters are equal constitutes an extraordinary invention, although such equality has already been attained in three-colour cinematography, whilst it is likewise obtainable without difficulty by increasing the opacity of the more transparent of the light-filters in a three-colour set by means of a neutral grey pigment. After development of the negative a print is made on a film of the same quality as positive cinema film. This print is then treated in a mordanting bath of copper ferricyanide and the three images are then dyed respectively pink, blue-green, and yellow. The dyed films are washed and dried and superimposed in register without being cemented to each other. The influence of the purplish-red colour of the mordant appears to have its effect on the greens of the coloured picture which were very dark in almost all the specimens shown.

Support is also being sought at the present time for a two-colour process of colour photography, the novelty of which is scarcely perceptible. A blue carbon print is superimposed on a P.O.P. print which has been toned red. Probably, in order to make still more certain that the two images shall not register, they are made respectively from the two negatives of a stereoscopic pair!

At a recent meeting of the cinematograph section of the French Photographic Society some sections of the two-colour film, " The Glorious Adventure " made by the Prizma process of W. van Dorn Kelley were shown and received a most favourable verdict. Part of the film representing a fire was of special merit.

L. P. Clerc.

SYSTEM IN HALF-TONE OPERATING: THE MISSING FACTOR IN THE NORMAL EQUATION.

In the " Process Year Book " for 1903-4 I wrote on the subject of constant ratio stops, constant screen separations, and exposure in half-tone operating. The subject at that time was not new to me, as I had been working along these lines for several years. I have continually advocated one-stop negatives, basing my contentions upon the belief that one stop would produce gradation nearer to the theoretical straight line than any combination of two or more stops. The general principle was adopted in our operating, but often departed from in the case of difficult copies, and more especially with coarse-screen work, but not always to the benefit of the result.

My faith in the principle, however, was never shaken, although I realised that there was a weak spot somewhere which had eluded me. In the first place, the stops were worked out for an average copy only, and any variation from the normal was, more or less, a matter of judgment, and, as all operators did not think alike, the standard negative did not always materialise. With continual practice along these lines, however, our operators produced a very good average of negatives in large quantities up to the outbreak of the War in 1914, when, in common with other houses, our staff became so depleted that we had only one operator left. Early in 1918 our only operator was taken seriously ill, and I had to take over the work at a few minutes' notice, not having touched it during the previous 3¼ years.

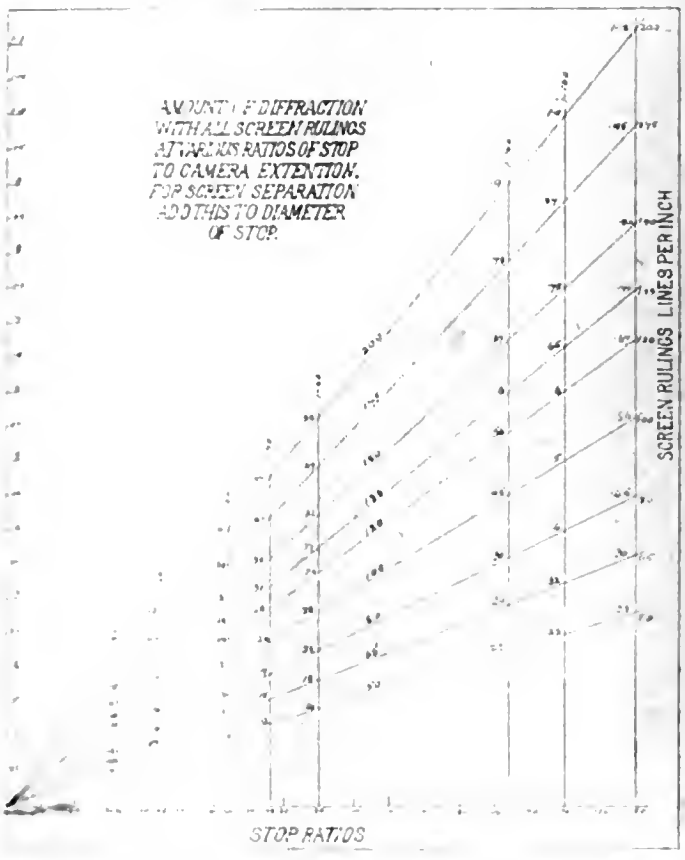
It was during this period that I evolved a system of classifying copies into five grades, and assigning a definite stop ratio and exposure to each grade at a fixed screen separation for all grades with each ruling. This was a step forward, but I was still dissatisfied because the screen separations had been found by trial and error methods, and I could not find any formula that would agree with the separations so found, and which were giving perfectly satisfactory results under the fixed conditions stated. It was found that the normal separation was satisfactory for 50 and 65 line screens, but as the rulings became finer the separation became gradually less, until the 200 line working distance was only a little more than half the separation indicated by the normal equation.

It only remained now to find the reason for these variations, and, although I believed that diffraction was playing a large part and spent a great deal of time in trying to locate the effects at the focal plane, I did not meet with much success.

In the autumn of last year, while still working on this problem, I was attracted by the halo surrounding the lens opening when illuminated by light reflected from a sheet of white paper, and viewed from the back of the camera through the screen. Changing the rulings from fine to coarse, it was noticed that the halo surrounding the lens became narrower, and that changing the stops with the same ruling also produced very marked changes in the width of this halo in relation to the stop diameter.

These halos were at first sketched and comparisons made, and afterwards photographed with a telephoto lens placed as near to the back of the screen as possible. From the results of these experiments I have plotted the size of the halo in relationship to the screen rulings, and to stops of different ratios to extension, the result of which is shown in the graph below.

The cause of the halo is undoubtedly diffraction, and is seen by the eye as the result of the interposition of a number of screen lines, the finer rulings producing the wider halo. I have no mathematical proof to offer that this is the form in which the dot is projected by the screen opening upon the photographic plate; the evidence is entirely circumstantial, but the closer I study the problem the more confirmation I obtain that, whatever is the cause, if the measurement of this halo is added to the diameter of the stop, the equation will then indicate the screen separation which will work under the conditions that I have laid down. The variations from the separations so found will be caused by varying thickness of line to space, thickness and refractive index of the glass or variations in the balsam sealing. Economic screens generally require a small increase of separation, due, I surmise, to the thicker film of balsam between the lines.



A very convenient stop ratio is 1-64, and this is the one that my system is based upon. It is interesting to note that the decimal measurement of the halo is the same as the denominator of the common fraction of the screen opening.

The normal equation for this ratio with a 200 line screen is:— 1 : 64 : : .0025 : .16 = 4.5 millimetres to screen lines.

The new equation will be:— 1 : 64 : : .0025 : .114 = 2.9 millimetres to screen lines.

I have reproduced a selection of the diffraction halos which will repay study, and will help to make the problem clearer.

B

Fig. 1 is very instructive. The halo is clearly shown as being composed of 8 overlapping circles of the same radius as the stop opening. It has been lined up to represent the relationship of the stop to the screen opening, and of the diffraction halo to the form of the dot in the negative. It will be seen how the least intense illumination is in the direction of the corners of the screen openings, and the brightest portion in the direction of the joining of the dots. It requires very little imagination to see how the square dot is formed from the round stop.

If a comparison is made with Fig. 2, it will be seen how the difficulty of obtaining a good join with a 50 line screen is

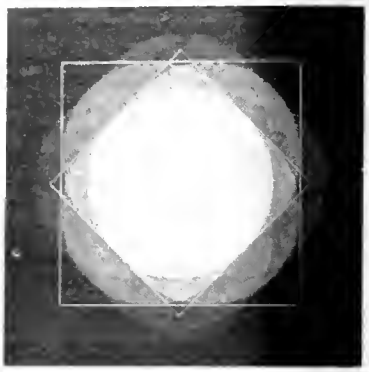


Fig. 1.—Stop 1-64, 200 line screen extra diameter due to halo .4.

easily accounted for. These are photographs of the same stop at the same extension, the only difference being the screen rulings, for which I have purposely selected the two extremes as being a better illustration of the principle.

Fig. 3 illustrates the important part played by diffraction when small stops are used, the photographic effect of which is much greater than the ratio of the aperture alone would

Fig. 2.—Stop 1-64, 50 line screen; extra diameter due to halo .1.

Fig. 3.—Stop 1-144, 200 line screen; extra diameter due to halo .9.

warrant, the effective diameter of the dot being doubled at a stop ratio of 1-160 with a 200 line screen.

I have confined myself to a broad statement of the case only, and must leave any attempt to discuss the application of this theory to practice to a future occasion. I have no wish to dogmatise as to any particular system of operating; my only desire is to bring light into a somewhat hazy and very debatable subject, and I hope that I have said enough to establish what I believe is a new principle in the calculation of screen separations in half-tone operating.

E. A. Bierman, F.R.P.S.

STUDIES IN COLOUR-SENSITIZING BY BATHING.

[A scientific paper, No. 422, recently published by the Bureau of Standards, Washington, is that entitled "Studies in Colour-Sensitive Photographic Plates and Methods of Sensitizing by Bathing," by Francis M. Walters, junr., and Raymond Davis. As will be seen from its somewhat abridged text, which we reprint, it contains the results of numerous trials respecting the best method of using pinacynol and other colour sensitizers, *e.g.*, dicyanine, pinaverdol, pinachrome, orthochrome T. and homocol. It also deals with the increase of speed in panchromatic plates by washing before exposure.]

Plates and films may be sensitized by two methods: (1) The dye may be incorporated in the emulsion at some stage in its preparation, usually immediately before coating, and (2) by bathing an ordinary blue sensitive dry plate in a solution of the dye. In general, the more sensitive plates result from bathing, but bathed plates often have the defect of not keeping.

The amount of dye required for sensitizing is very small. When incorporated in the emulsion, 2 to 4 mg. to 100 ccs. of emulsion give the best results with most dyes, while in bathing the best concentration lies between 1 part in 25,000 and 1 part in 75,000, although much smaller amounts give some sensitizing action.

In order to sensitize, a dye must combine with the silver bromide itself. Further, the dyestuffs which sensitize all fall into the class of so-called substantive dyes; that is, they dye substances directly. The centre of the region which is sensitized by a given dye lies about 20 millimicrons farther toward the red than the centre of the absorption band of the dye.[1] Thus dyes which sensitize for the yellow-green are reddish in colour, as, for example, erythrosin and pinaverdol. Dyes which sensitize for orange are purple, and red sensitizers are greenish. Eder found that the less silver iodide a silver bromide gelatine emulsion contained the better it sensitized. Silver chloride sensitizes readily, but its original sensitiveness is so much less than that of silver bromide that the sensitized salt does not compare in rapidity with sensitized silver bromide.[2] An important characteristic of a dye suitable for sensitizing is its solubility. It must be soluble in water, or it must at least be capable of forming a fairly stable colloidal solution with it. Dyes soluble only in other solvents—for example, alcohol—cannot penetrate the gelatine in such a manner as to dye the silver bromide. In addition, the dye should be of such a character as not to stain the gelatine so as to prevent the light from penetrating to the silver bromide. Were it not for this necessary characteristic, there are probably many dyes which would sensitize.

Before the war sensitizing dyes were principally imported from Germany. When this supply was cut off, the preparation of the dyes was undertaken by various laboratories in England and in the United States. The Ilford Co. of London produced pinacyanol and pinaverdol, while in this country the Eastman Kodak Co. are making orthochrome T as well. The colour laboratory, Bureau of Chemistry, Department of Agriculture, has prepared pinaverdol, pinacyanol, and dicyanine. The success of these investigators has led to the preparation of entirely new sensitizers which promise marked improvement in panchromatic plates.

While commercial panchromatic plates are now sufficiently rapid for the photography of still objects and for three-colour process work, there are certain problems which demand plates which are either more rapid or which are sensitive to radiations to which the panchromatic plate is not. Those who have these problems find it advisable to use ordinary plates sensitized by bathing. Important among the special problems are those in the field of spectroscopy, in which use is made of dicyanine to photograph infra-red spectra, and specially stained plates are indispensable in recording the visible spectrum of faint sources.

The directions which are furnished by the dye manufacturer for

1. Eder, Handbuch, 3, p. 150.
2. Eder, Handbuch, 3, p. 154.

using the dye for bathing are at variance with the methods used at this Bureau and by some other workers. The work described in this paper was undertaken with the view of ascertaining the relation between the methods developed at this Bureau and the practice recommended by the dye makers.

Since pinacyanol is the most widely used red sensitizer and since good orthochromatic plates may be obtained commercially, the greater part of the investigation was done with this dye. Various methods and conditions of bathing were studied and keeping tests were made on plates sensitized by two methods of bathing. In addition to pinacyanol other important sensitizing dyes were studied.

Methods of Studying Colour Sensitiveness.

In studying the various ways of sensitizing by bathing two methods were employed: (1) The continuous spectrum of a source of white light was photographed on the plate, and (2) the speed of the plate to white light was measured and the filter factors of the plate with a given set of colour filters were determined.

Spectrograph Method.—The spectrograph shown in fig. 1 was designed for studying the colour sensitiveness of plates.

The light-source (*L*) is a 100-watt tungsten lamp whose brightness is kept constant by adjusting a rheostat to maintain a constant current through the filament. Around the lamp is a white reflector (*R*), while in front of the slit is a piece of ground glass, to give uniform illumination along the slit, which is 2 inches high. Between the ground glass and the slit is placed a rotating disc (*D*), out of which is cut a variable aperture such that the exposure

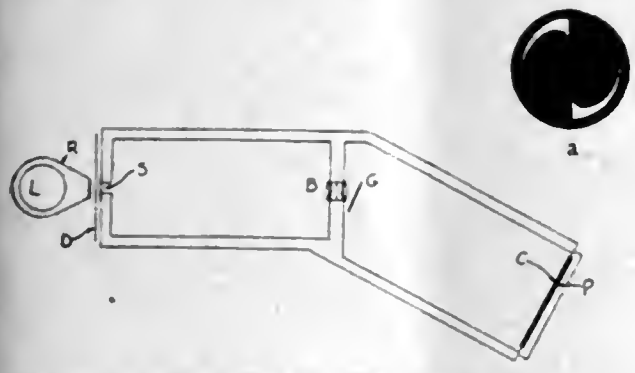


Fig. 1.—Diagram of Spectrograph.
Disc *a* for varying exposures is mounted at *D*. *L* is the lamp; *R*, reflector; *S*, slit; *B*, lens; *G*, grating replica; *c*, wave-length scale in contact with plate under test.

along the slit varies in a fixed manner with the distance from its ends. The series of horizontal lines on the spectrograms indicate geometrically decreasing exposures. The exposure at the first line from the bottom is one-fourth that at the bottom; at the second line, one-sixteenth; at the third, one sixty-fourth; at the fourth, one two-hundred-and-fifty-sixth; and at the top, one one-thousand-and-twenty-fourth. The light from the slit passes through first a photographic lens (*B*), then a replica of a diffraction grating, which disperses it into a normal spectrum. Just in front of the plate (*P*) is a screen (*C*) bearing on it the reference lines which mark both intensities and wave lengths on the plate. The end of this screen, through which the red part of the spectrum passes, is stained with "rapid filter yellow" to screen out the second-order violet light, which in the grating spectrum is superposed on the first order red.

The tungsten lamp used for the investigation does not have the same spectral distribution of energy as does the sun. The tungsten lamp is deficient in the blue as compared with the sun, and is relatively more intense in the red than the sun.

The spectrograph serves as a very convenient means of studying qualitatively the sensitizing action, showing as it does the regions of sensitiveness, both as to extent and as to the location of the maxima, and also, in addition to other detriments, the degree of fog induced by the process. For work of a quantitative character, however, such as a study of the time of bathing or the effect of the proportion of dye in the sensitizing bath, greater exactness is desirable. This is found in photographic sensitometry.

Sensitometry consists in the exposure of a photographic material to a known source of light for definite intervals of time, the development of the material under standard conditions, and an interpretation of the blackening produced on the material in relation to the time of exposure and the intensity of the light acting. The details of the methods of sensitometry used in this work will be described in a forthcoming Bureau scientific paper.

Sensitometry is applied to the study of colour sensitizing by using filters which transmit light of particular colours only. The filters used in this investigation are Wratten A, which gives the red sensitiveness; Wratten G, which gives very nearly the added sensitiveness due to the dye; Wratten B, which gives the sensitiveness to green, and Wratten C, to blue.

The speed or sensitiveness of the plate to the light transmitted by the filter may be measured by either introducing the filter between the light source and the plate in the exposing apparatus or by measuring the speed to white light and dividing this by the filter factor of the plate. When a number of filters are used, the second is the more rapid. The following procedure was, therefore, employed: Three strips from the sensitized plate were exposed in the sensitometer to a light-source having approximately the spectral energy distribution of average noon sunlight, the strips were developed for different times, the densities measured and plotted against the logarithm of the time of exposure, and a speed determination made according to the method of Hurter and Driffield[3]. When used with the four Wratten filters mentioned above, two strips from the plate served to determine the factors of the plate.

The filter factors were measured as described in Bureau Scientific Paper, 309. The principle of this consists in varying the intensity of the light-source until equal blackening is produced with equal exposure time with and without the filter. Since the filter factor gives the ratio of the total sensitiveness of the plate to its sensitiveness to the light transmitted by the filter, the filter factor and the speed of the plate without the filter give the data necessary to determine the speed of the plate with the filter. For example, if the speed of a plate to white light (average noon sunlight) is 400 and the filter factor with the A filter is 10 the speed through the A filter is 40.

The method of stating colour sensitiveness employed by Eder,[4] Sheppard and Mees[5] and Wallace[6] gives the added or chromatic sensitiveness in terms of the blue sensitiveness. This method we believe to be unsatisfactory, because the blue sensitiveness is decreased more or less by any process of sensitizing to other colours and because the ratio of the colour sensitiveness to the blue sensitiveness does not give the best basis for comparison of one plate with another. The question to be answered is, Does this method or that give the greatest sensitiveness to a given colour of light, regardless of what happens to the blue? This question is most directly answered by the speed of the plate to the light in question.

Pinacyanol.

Pinacyanol is, for many purposes, the most important sensitizer. Although it is commonly used in commercial panchromatic plates in conjunction with other sensitizers which give greater sensitiveness in the yellow green, it alone gives a fairly good panchromatic plate.

Water Bath.

The following is typical of the directions given by the makers for the use of pinacyanol. Dissolve 1 part of pinacyanol in 1,000 parts of ethyl alcohol for the stock solution. To make red-sensitive plates bathe ordinary gelatine plates for two or three minutes in the following solution: Water, 200 parts; stock solution, 3 parts. Wash well in running water, or frequent changes for several minutes and dry in total darkness as quickly as possible in a current of warm, dry air free from dust.

If these directions are followed, it is found that the dye precipitates on standing after a plate has been bathed in it, or often before the plate has been sensitized, which results in the plate being spotted and lacking in sensitiveness. Pinacyanol is not soluble enough in cold water to wash away any dye deposited on the plate in the gelatine.

The addition of a little ammonia, potassium bromide, and other electrolytes to the dye bath (water 200 cc., pinacyanol stock solution 3 cc.) causes flocculation of the dye. This may indicate

5. Ferguson, "Photographic Researches of Hurter and Driffield," Royal Photographic Society, London, 1920.
4. Eder and Valenta, "Beitrage zur Photochemie II.," p. 126.
5. Sheppard and Mees, "Investigations on the Theory of the Photographic Process," p. 330, London, 1907.
6. R. J. Wallace, "Astrophys. Jour.," 26, p. 305; 1907.

that the bath is not a true solution, but a colloidal solution or dispersoid.

This phenomenon suggested to the writers that the failure of the water bath in sensitizing ordinary commercial plates might be due to the presence of electrolytes in the emulsion. It is customary to add to the emulsion immediately before coating a small quantity of chrome alum to harden the gelatine, so that it will withstand alkaline development at room temperatures. There may also be present various other electrolytes, such as soluble bromides to restrain fog.[7] If present, these soluble salts would come to the surface of the plate in drying and would thus be in a position to cause the speedy flocculation of the dye bath.

Accordingly, we tried washing the plates in tap water before bathing in a water solution of pinacyanol and found that the plates then did not cause the flocculation of the dye bath. The time for bathing is also decreased by this operation, since the gelatine swells somewhat and permits diffusion to take place more rapidly. With a washing time of five minutes the time required for sensitizing is decreased to two minutes.

While not so fast as plates sensitized in a bath containing ammonia, the water bathed plates show considerably less initial fog and also keep much better.

Another point of importance is that if a plate be examined after removal from the dye bath there is found on it a considerable amount of the dye which is not removed by washing in water. In addition, there is a considerable staining of the gelatine, which decreases by its screening action the sensitiveness of the plate. Rinsing the plate in ethyl alcohol after the dye bath will remove to a large extent the dye dissolved in the gelatine, as well as that on the surface, while not affecting that which has combined with the silver bromide and to which the sensitizing action is due. That this is true may be shown by the fact that prolonged bathing in alcohol after sensitizing in the water bath does not decrease the colour sensitiveness. It is common experience that bathed plates must be dried rapidly to secure speed and freedom from fog.[8] In addition, therefore, to furnishing cleaner plates, the rinse in alcohol aids in drying the plates. The drying is accelerated by the alcohol, which replaces to a large extent the water in the gelatine film.

Water, Alcohol, and Ammonia Bath.

It has been observed (particularly with erythrosine) that the addition of ammonia to the dye bath increases the sensitizing action of the dye. If ammonia be added to a water bath of pinacyanol, flocculation occurs and prevents sensitizing. However, ammonia may be safely added to the dye bath if sufficient alcohol be present. Thus the formula used at this Bureau calls for—

Water	60 parts.
Ethyl alcohol (95 per cent.)	40 ,,
Pinacyanol stock solution (1 to 1,000)	4 ,,
Ammonia (28 per cent.)	4 ,,

For ordinary work this quantity of ammonia usually gives too much fog and is recommended only in the case of plates which are used for position measurements, as in spectroscopy. If the amount of ammonia be cut from 4 to 2 ccs. the sensitizing action is nearly as great and the fog is much less. Compared with plates bathed in water and pinacyanol, the sensitizing action is twice as great. The sensitizing action of a bath composed of water and alcohol with no ammonia is less than the bath containing water only. For use in spectroscopy the ammonia method has the particular advantage of extending the region of sensitiveness, so that lines further in the red may be photographed.

It should be emphasised, however, that ammonia as a sensitizer reduces the keeping qualities of plates below those of other sensitizers.

Keeping Tests.

In making the test on the relative keeping quality of plates sensitized by the two methods of bathing, a slow portrait plate which works fairly free from fog was used. A dozen of these were bathed by each method on a clear, dry day.

The water bathing was carried out as follows: The plates were placed in the case of a developing tank, washed in running tap water (temperature 18° C.) for five minutes, then transferred to a bath composed of tap water 1,900 ccs., pinacyanol stock solution (1 to 1,000) 38 ccs. After bathing for two minutes they were placed in alcohol for two minutes, swabbed off, and dried in a light-tight cabinet, through which air at room temperature was forced by an electric fan. When dry the plates were packed face to face in an ordinary plate box.

The other dozen plates were placed directly in a tank containing a bath composed of—

Water	1,300 parts.
Ethyl alcohol	700 ,,
Pinacyanol stock solution	40 ,,
Ammonia (28 per cent.)	40 ,,

After four and one-half minutes in this bath (18° C.) the plates were rinsed for two minutes in alcohol, swabbed off, and dried.

As soon as the two sets of plates were dry one of each was exposed in the sensitometer, and its filter factors were also measured. Another pair was treated in the same manner a few hours later on the same day. Then tests were made once a day for a few days and finally at intervals of about a week

The curves in fig. 2 show the variation in speed [9] to white light and the fog [10] of the plates sensitized by the two methods.

Fig. 3 shows the characteristic curves for a plate sensitized with pinacyanol, water, alcohol, and ammonia when the plate was usable, while fig. 4 shows the characteristic curves of a similar plate after it had become unfit for use.

The variation in speed through filters with time of keeping is shown in figs. 5 and 6. If these curves be compared with those for the variation in speed to white light (fig. 8), it will be seen that while the speed to white light was decreasing the speed due to the added sensitiveness conferred by the pinacyanol did not decrease at quite the same rate.

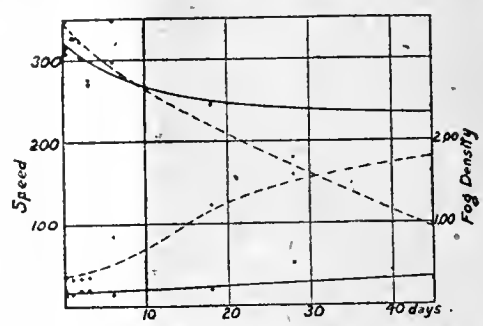


Fig. 2.—Keeping tests on plates sensitized with pinacyanol.
The curves which start at the upper left-hand corner of the graph show the speed to white light, while those that start at the lower left-hand corner show fog (for unit development to unit contrast) measured in density. Full lines: Plates sensitized with pinacyanol and water. Dotted lines: Plates sentitized with pinacyanol, water, alcohol and ammonia.

Note.—The fog is given for $\gamma=1$; that is, a development such that the contrast of the negative is the same as that of the subject.

Bathing Films.

In sensitizing films with pinacyanol it was found that the method of pre-washing and bathing in a water solution of the dye was not successful and that to get adequate sensitizing action it was necessary to use the bath containing water, alcohol, and ammonia. Films have a tendency to give more fog with bathing than do some plates. It has been remarked by some that any orthochromatic emulsion gives more fog when bathed than ordinary plates, and

7. Eder, Handbuch, 3, p. 86.
8. R. J. Wallace "Astrophys. Jour.," 26, p. 299; 1907.

9. "Speed" as used here is measured by the method of Hurter and Driffield. Briefly, this is as follows: When the density due to exposure to light is plotted against the logarithm of the time of exposure some of the points will lie on a straight line. If samples of the plate which have received a set of exposures are developed for different lengths of time, their respective straight line parts extended intersect nearly in a point on the exposure axis. The value of the exposure at this intersection point is called the "inertia" of the plate. The speed numbers used by us are 10 divided by the inertia, so that the greater the speed number the faster the plate. This number was selected instead of Hurter and Driffield's 34/I because the light source employed by them (the sperm candle) is deficient in the blue as compared with our light source, which approximates average noon sunlight in its distribution of spectral energy. It should be noticed that for this reason our speed numbers are not convertible into Hurter and Driffield numbers.

10. Fog is measured as density. Density is defined as $\log^{10}(1/T)$, where T (transmission) is the ratio of the transmitted to the incident light. Thus a fog density of 0.30 transmits one-half of the light falling on a plate; a density of 1.00, one-tenth of the incident light and a density of 2, one one-hundredth

suitable films for bathing are not obtainable except with some degree of orthochromatism. In bathing films it is necessary to

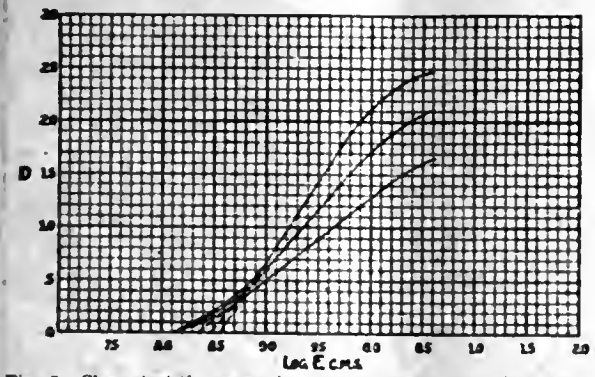


Fig. 3.—Characteristic curves for freshly bathed plate (pinacyanol, water, alcohol, and ammonia).

exercise considerable care that nothing comes in contact with either side of the film, since the back is usually coated with gelatine to

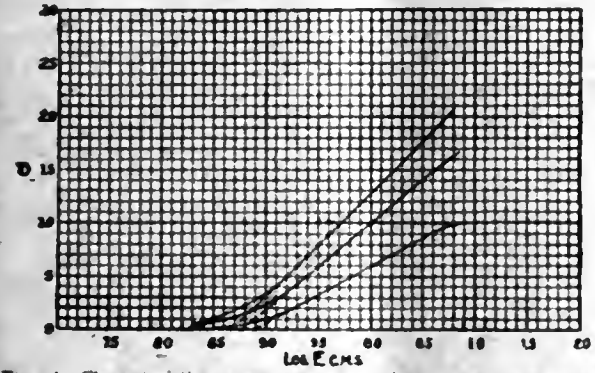


Fig. 4.—Characteristic curves for old bathed plates (pinacyanol, water, alcohol, and ammonia).

make the film non-curling. If the back of the film becomes scratched, these scratches will cause defects in the print.

FRANCIS M. WALTERS, JUNR.
RAYMOND DAVIS.

(To be continued.)

TWO-COLOUR EFFECTS ON DEVELOPMENT PRINTS BY SELENIUM TONING.

In the current issue of "Photographische Rundschau," Walter Forstmann describes the use which can be made of the single-solution selenium toner for producing two-colour effects in prints of a kind somewhat similar to those produced by local treatment of a print on self-toning paper with a solution of salt, but of greater range as regards colour. The process is based on the fact that a selenium-toned print is considerably altered in colour by treatment with a photographic reducing bath, such as the Farmer mixture of hypo and ferricyanide. By this method a print ranging in colour from purplish to warm brown may be obtained. The double tones which the process yields are very suitable for subjects such as evening effects, snowscapes, etc., since the contrasts in the original subject are reproduced, whilst, at the same time, a suggestion of the colouring is conveyed. By toning in the selenium bath for a greater or less time, the tones may be produced within fairly wide limits. On reduction, the details in the high-lights are not eaten away as is usually the case with the Farmer reducer, since the whole of the silver image has been converted into silver selenide. The latter is not attacked by potassium ferricyanide.

The well-washed prints may be toned in any suitable selenium bath without previous bleaching. Commercial baths vary as regards their suitability for different papers, some working best with gaslight papers and others with bromides. For purple tones the prints should be as fully developed as possible. In proportion as the colour of the developed and fixed print varies from black towards brownish or greenish, the warmer the purple tone which is finally obtained after reduction. Bromide prints, which (as is well known) tone with a lesser degree of readiness in the selenium bath, yield the same tones as gaslight prints after reduction, even if the selenium-toned image does not exhibit a distinct bluish or warm-black colour. For bromide prints it is well to use the selenium bath of about double strength. In the case of prints which have been developed as fully as possible, the time in the toning bath may be some minutes.

After a brief rinse, the prints are transferred to a 10 per cent. solution of potassium metabisulphite in order to clear the lights, and are then washed in running water for ten minutes. Without drying, the prints are then treated in the reducer. If they have been allowed to become previously dry, they must be thoroughly soaked in water before immersion in the reducer. The latter is the ordinary Farmer reducer, made up by adding a few drops of potass ferricyanide solution to hypo solution of from 5 to 10 per cent. strength. The mixture should be of pale yellow colour. It requires to be kept of about this strength (as judged by the colour) by addition of ferricyanide solution. After reduction the prints are finally washed for about half-an-hour.

The longer the time of toning in the selenium bath, the browner the tone which is produced, but it is to be noted that the prints become more purplish in colour on drying. Omission of the clearing bath between toning and reducing causes the whites to remain of pale yellowish colour; for many subjects this is by no means a disadvantage, the coloration in the high-lights improving the whole effect of the print. The following table shows at a glance the range of effects which can be obtained according to the kind of print and the degrees of toning and reduction:—

Development of black print	Time of toning	Time of reducing.	Colour of Finished Print.		
			Shadows.	Half-tones.	High-lights.
Full	Short*	Short	Black	Purple	Warm purple
Full	Long	Long	Purple	Warm purple	Brownish purple
Fairly full ..	Short	Short	Purple	Warm purple	Brownish purple
Fairly full ..	Long	Short	Warm purple	Brownish purple	Brown
Fairly full ..	Long	Long	Brownish purple to brown		
To greenish or brownish colour.	Long	Long	Warm brown to greyish brown		

* Barely perceptible toning.

It is to be noted that the contrast of the print is increased very slightly—to scarcely a perceptible extent. Any required reduction of the depth of the print must, therefore, be done before toning. It is not possible to give exact figures for the times of toning or reduction, since these depend greatly on the particular paper which is used and on the strength of the toning bath. A very little experience, however, will enable any particular tone to be obtained.

FORTHCOMING EXHIBITIONS.

August 26 to September 9.—Toronto Camera Club. Latest date for entries, July 22. Secretary, J. H. Mackay, Toronto Camera Club, 2, Gould Street, Toronto, Canada.

September 9 to October 7.—London Salon of Photography. Latest date for entries, August 30. Particulars from the Hon. Secretary, London Salon of Photography, 5a, Pall Mall East, London, S.W.1.

September 11 to 15. Professional Photographers' Association, Princes Galleries, Piccadilly, London, W. (Trade and Professional). Hon. Secretary, Richard N. Speaight, 157, New Bond Street, London, W.1. Also foreign invitation loan exhibition of professional portraiture. Hon. Secretary, Marcus Adams, 43, Dover Street, London, W.I. Latest day for entries and exhibits, August 31.

September 18 to October 28.—Royal Photographic Society Annual Exhibition. Latest date for Entries, August 25 (carrier); August 26 (hand). Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

Photo-Mechanical Notes.

Contact Reproductions by Reflected Light.

In these notes of October 28, 1921, p. 645, particulars were given of the Mamil process of Max Ullmann, by which a result similar to that by the Vandyke process is obtainable from originals printed on both sides. A further specification, No. 156,691 of 1920, by Herr Ullmann adds something to the fragmentary working details which have been disclosed by the inventor.

It is pointed out that in the industrial use of the process according to Eng. Pat. No. 24,607 of 1913 (B.J. 1914, September 18, p. 714), the inconvenient experience has arisen that the water-soluble aniline dyes by means of which the chromate colloid coating remaining on the plate after the latter has been developed, is rendered opaque to light, become bleached out (that is to say, "bleeds") when left in water. Consequently the pictures lose their sharpness and have to be dyed again.

Further, it has been found rather difficult to apply aqueous preparations (e.g., a solution of gelatine) after drying the negative, without the risk of the coats taking up the dyes from the negative.

These drawbacks are obviated by converting the employed basic or acid dyes into water-insoluble coropounds.

It is known that basic and acid dyes are rendered water-insoluble by certain salts or acid or basic substances according to the character of the dye.

Thus, for instance, an aqueous solution of di-amido-stilbene-disulpho-acid diphenol yields a water-insoluble precipitate with dilute aqueous solutions of penta-methyl-*p*-rosaniline.

For example, in order to render the chromate colloid negative insoluble in and impervious to water, it is dyed in a dilute solution of penta-methyl-*p*-rosaniline, and then the dyed negative is bathed in a dilute aqueous solution of di-amido-stilbène-disulpho acid di-phenol. The result of these operations is that the water-insoluble dye-lake is formed in the chromate colloid coating, so that there is no running of the dye during the time that the negative is lying in the water, nor do warm gelatine solutions take up any dye if such are poured over the negative.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, June 26 to July 1 :—

CAMERAS.—No. 17,551. Photographic camera. A. Andriotis.

LENSES.—No. 17,908. Lenses for telescopes, cameras, etc. M. J. Gunn.

APPARATUS.—No. 17,673. Apparatus for automatically timing photographic exposures. Soc. Godefroy Frères.

CAMERAS.—No. 17,550. Photographic camera. A. Thomson.

VIEW-FINDERS.—No. 17,626. View-finders for photographic cameras. F. Southworth.

RETOUCHING.—No. 17,525. Apparatus for retouching photographs, etc. A. Bennett.

TRANSFER PROCESS.—No. 18,018. Method of transferring photographs on to fabric, paper, etc. A. Cohen.

PHOTOGRAPHIC MEDIUMS.—Nos. 17,851 and 17,852. Photographic mediums. F. W. Hochstetter.

COLOUR PHOTOGRAPHY.—No. 17,730. Process for production of transparencies for projection of photographs in natural colours. H. Diernhofer.

COLOUR CINEMATOGRAPHY.—No. 17,546. Colour projection apparatus for cinematographs. R. Killick and K. & S. Synd., Ltd.

COLOUR CINEMATOGRAPHY.—No. 17,791. Colour cinematography. R. F. E. Miller.

COLOUR MIXTURE.—No. 17,830. Device for admixture and control of light and colour for photography and photographic projection. M. J. Gunn.

COMPLETE SPECIFICATIONS ACCEPTED.

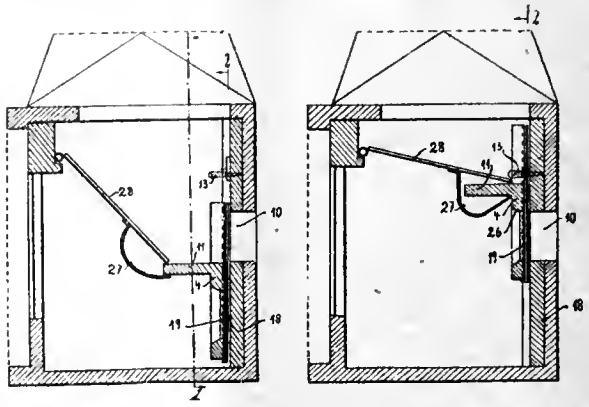
These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

NON-FOCAL-PLANE REFLEX CAMERA, No. 180,350 (November 19, 1920.)—The mirror 28 is directly connected with and controlled by a sliding piece 4 (moving behind the lens 10), which controls the duration of exposure.

A lateral support 11, on the sliding-piece 4, carries the one end of the mirror 28, and light-tight pocket 27 connecting the lateral support and the mirror in all positions of the latter.

The sliding-piece 4 is coupled with a shutter 19 by a spring, and both parts are controlled in such a manner that in the case of an instantaneous exposure the slide 4 and the shutter move successively without any hindrance from the set position through



the exposure position into the closed or end position, whilst in the case of a time-exposure the shutter is retained and the slide 4 moves alone from the finder position into the exposure position, in which it is retained until upon a new actuation of the apparatus the slide 4 is released and moves farther on to the end position, whilst the shutter 19 moves behind the slide at once from its first position through the exposure position on to the closed or end position.

The specification describes and illustrates other mechanism by which these movements are effected.—John Steenbergen, 65, Gottfried Keller Strasse, Dresden, Germany.

CINEMATOGRAPH PROJECTION LENSES.—No. 180,949. (September 3, 1921.) The invention relates to objectives used for cinematograph projection, and its aim is to secure a better and more uniform illumination of the projection screen than is possible with present types of projection lenses. With this lens the illumination of the screen falls off less rapidly from the centre to the edge of the screen than is usual.

The improved illumination of the projection screen is achieved by a novel constructional modification of the well-known Petzval portrait lens, in which modification the ratio of the back focal length of the objective to its equivalent focal length is not greater than .35. In the common proportions of the Petzval portrait lens the ratio of the back focal length to the equivalent focal length usually exceeds .5 : in the example quoted by Von Rohr, page 250 of his "Theorie u. Geschichte der Photographischen Objective" this ratio is .58.

In a projection objective consisting of two separated components, we call the component which is the nearer to the object in cinematograph projection the back component, and the component which is the nearer to the projected image we call the front component. By the term "back focal length" we mean the focussing distance of an object behind the back component when the projected image is infinitely distant.

The amount of light transmitted by an objective from any point on the object to the corresponding point of the image is proportional to the solid angle subtended at the object-point by the entrance pupil of the objective. The novel proportions adopted for an objective according to the invention have for aim, therefore, to throw the entrance pupil of the objective

nearer to the object so that a greater quantity of light is passed to the screen for imaging purposes in the peripheral parts of the field than is passed by a lens of ordinary type working at the same aperture.

In the usual type of Petzval portrait objective now on the market, the ratio of the back focal length to the E.F.L. is generally higher than .5, and the entrance pupil, when the objective is used for cinematograph projection, is between the front component and the projected image; whereas in the new construction the entrance pupil is nearer to the object, lying on the other side of the objective, somewhat further from the objective than the object, a better position when, as often happens in cinematograph projection, the object is small compared with the focal length of the objective.

The new construction is illustrated by a numerical example below and by fig. 1. R, R_1, etc., denote the radii of the surfaces proceeding from the front to the back, i.e., in the direction opposite to that in which light travels when

Fig. 1.

the objective is used for cinematograph projection, and the + sign denotes that a radius receives this light on its concave side, and a − sign that it receives light on its convex side. The glass material is defined by the values of the symbols n_D and v, both of which we use in the conventional sense, and by the type number in Chance's optical glass catalogue. The lens thicknesses are denoted by T, T_1, etc., counting from front to back, and the separation of the two components by S. All the dimensions are in inches. This objective is illustrated by fig. 1 of the drawings.

E.F.L. 10″. Back focal length 2.508″ (fig. 1).

					Type No.
$R_1 + 10.700$					
	$T_1 = .698$	n_D 1.509	v 64.3		646
$R_2 - 8.940$					
	$T_2 = .348$	n_D 1.651	v 33.5		5093
$R_3 - 39.60$					
	$S = 13.10$		air		
$R_4 + 2.938$					
	$T_3 = 1.128$	n_D 1.509	v 64.3		646
$R_5 - 5.030$					
	$T_4 = .206$	n_D 1.651	v 33.5		5093
R_6 ∞					

—Arthur Warmisham and Kapella, Ltd., both of 102, Stoughton Street, Leicester.

Dry-mounting.—No. 179,826 (May 11, 1921).—Aluminium plates are substituted for zinc or other plates. By the use of aluminium plates a considerable reduction in the time expended in the process is effected, as heat from the press is uniformly distributed throughout the aluminium plate at a much quicker rate.

The plates are preferably provided with tube or handles of non-conducting material to facilitate the manipulation of them when hot.—Joseph Henry Stean, 6, Highbury New Park, London, N.5.

Viscose Sensitive Films.—No. 179,500. (January 26, 1921).—The claim is for the process for the manufacture of a sensitive viscose or similar cellulose film with a carrier permeable to water, which consists in providing the carrier with a sensitive emulsion in such way that the concentration of the sensitive salt is effected on one surface only, by thoroughly moistening the carrier in water, removing the surplus water, subsequently coating the still wet carrier with a photographic emulsion having a gelatine base, uniformly distributing the coating and thereupon coagulating the emulsion in the usual manner.—Jaques Edwin Brandenberger, 16, Rue du Louvre, Paris.

Viscose Sensitive Films.—No. 179,250 (January 26, 1921). The raw viscose support is passed through the first sensitising bath, which serves to cause the film to swell up and to impregnate it with one of the products intended to react subsequently. After this, and before passing the film through the second bath, it is doubled; that is to say, two films are laid one against the other, and passed, for example, between pressing rollers. Thus a double film is obtained which is then submitted to the action of the final bath with the object of forming the sensitive salt in the interior of the film. After this operation the two films previously stuck together are separated and thus two films are obtained in which the sensitive salt is found to be concentrated on a single surface.—Jaques Edwin Brandenberger, 16 Rue du Louvre, Paris.

The following complete specifications are open to public inspection before acceptance :—

Apparatus.—No. 182,117. Photographic apparatus. W. Fenerzeug.

Lenses.—No. 182,106. Endless series of lenses destined for a cinematograph, affording optical compensation of the travelling of the image. Firm of C. Zeiss.

Paper Films.—No. 182,085. Manufacture of paper films. V. Kriegerbeck and J. Bautz.

Cinematography.—No. 182,087. Cinematographic apparatus. V. Kriegerbeck and J. Bautz.

Trade Names and Marks.

REGISTRATIONS RENEWED.

Autochromes Lumière.—No. 306,657. Union Photographique Industrielle Etablissements Lumière and Jougla Réunis. Registered in 1908 in class 1.

Perfecta.—No. 301,933. Thornton-Pickard Manufacturing Co., Ltd. Registered in 1908 in class 8.

Wellington 'Xtra Speedy (Label).—No. 305,462. Wellington & Ward. Registered in 1908 in class 1.

Hyptona.—No. 304,958. Ilford, Ltd. Registered in class 39 in 1908.

Sunbeam.—No. 301,048. Thornton-Pickard Manufacturing Co., Ltd. Registered in 1908 in class 8.

Ruby.—No. 302,845 Thornton-Pickard Manufacturing Co., Ltd. Registered in 1908 in class 8.

Azol.—No. 302,671. Johnson & Sons, Ltd. Registered in 1908 in class 1.

Lingbain.—No. 302,161. John J. Griffin & Sons, Ltd. Registered in 1908 in class 39.

Pigmol.—No. 300,964. John J. Griffin & Sons, Ltd. Registered in 1908 in class 39.

TRADE MARKS REMOVED FROM REGISTER.

In the official language of the "Trade Marks Journal" the following trade marks have been "removed from the register through non-payment of renewal fees." Such non-payment is of course the method adopted by a firm having no further occasion for the use of a mark.

Vesca.—No. 299,018. London Stereoscopic and Photographic Co., Ltd. Registered in 1907 in class 8.

Electroid.—No. 301,374 A. W. Penrose & Co., Ltd. Registered in 1908 in class 11

P.P.A. Congress Exhibition.—The following have consented to act as judges at the photographic exhibition to be held in connection with the Congress of the Professional Photographers' Association, Ltd., on September 11-15, at the Princes Galleries, Piccadilly, S.W.1:—The Right Hon. the Earl of Carnarvon, Mr. Pirie MacDonald, Mr. Furley Lewis, Mr. J. B. B. Wellington, and Mr. H. W. Bennett. Silver and bronze medals will be placed at the disposal of the judges for awards.

Photographische Korrespondenz.—In consequence of the economic conditions in Austria, the Vienna Photographic Society has suspended the regular publication of "Photographische Korrespondenz" during the present year, and has published a special issue, a "Festnummer," which celebrates the sixtieth anniversary of the foundation of the Society. This issue contains a large number of contributions by photographic writers and experimentalists on the Continent, and includes some papers of special interest, to which we have already drawn attention. The "Festnummer" is published by the Vienna Photographic Society, 25, Westbahnstrasse, Vienna VII. In Austria its price is 1,500 kronen; for other countries, with the exception of Germany, the price is 10 Swiss francs.

New Books.

BROMOIL PRINTS AND BROMOIL TRANSFERS.—A welcome *résumé* of recent methods in Bromoil printing is provided by No. 186 of the "Photo-Miniature" just published. Within the pages of a very practical monograph have been brought together the experience and formulæ of a large number of Bromoil workers in this country and America, among them Raymond E. Crowther, S. Grimshaw, G. Bellamy Clifton, A. C. Barfield, Dr. A. D. Chaffee and W. H. Zerbe. Recommendations of suitable bromide papers and of bleach formulæ are here in sufficient abundance to satisfy the habitually experimental mind of the Bromoil enthusiast, whilst the less experienced in the method will derive considerable aid from the detailed instructions in pigmenting. The transfer Bromoil process is the subject of a special chapter, in which a few hints are given, and, we are glad to see, some strong cautions uttered, regarding the making of multicolour Bromoils by transfer. Altogether the issue of our little contemporary is a timely addition to the literature of the Bromoil process. It is illustrated by reproductions of Bromoils by pictorialists in the United States, which scarcely do justice to the qualities of the process. Published in this country by Messrs. Houghtons, Ltd., 88-89, High Holborn, London, W.C., price, 1s. 8d.; in the United States by Tennant & Ward, 103, Park Avenue, New York, price 40 cents.

New Apparatus.

The Salex 3½ by 2½ in. Reflex. Sold by the City Sale and Exchange, 54, Lime Strect, London, E.C.3.

APPROPRIATELY to our note of last week on the convenience of the reflex camera in the 3½ x 2½ in. size, comes a camera of this size and pattern which the City Sale and Exchange have just introduced, complete with 4¼-in. *f*/4.5 anastigmat lens, at the moderate price of £10 17s. 6d. The camera is built for taking pictures the

"landscape" way of the plate, and has the lens in a focussing mount. Its overall dimensions are approximately 5¼ x 5 x 5 ins., and its weight about 2 lbs. The focal-plane shutter obtains a full range of speeds by alteration in the width of the slit combined with tension of the spring. The mirror is of the hand-raised pattern, and the hood, which is kept in place when folded by a pair of leather flaps, is 5½ ins. in height when erected. There is flexible metallic release of the shutter, and the price of the camera includes three single metal dark-slides, film pack adapter, and leather sling shoulder strap, together with a back focussing screen and hood. A bush for the tripod screw is provided in the base of the camera, so that it can be used in the ordinary way with the mirror in the up position, a lever on the outside of the camera holding the mirror up, as required when making time exposures.

New Materials.

PLASTIC WOOD.—This mouldable material, which hardens on exposure to the air into a tough, solid waterproof substance, is a new manufacture of Messrs. Necol Industrial Collodions, Ltd., 62, London Wall, London, E.C.2. It is a thick paste, or rather dough, having an odour of ether, which quickly sets into a solid, hard mass, yet allows of sufficient time for its use in stopping holes in woodwork. No doubt the material will find useful applications in minor repairs to cameras or other photographic apparatus of wood. It is supplied in tins at the price of about 2s. 6d. per pound.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SATURDAY, JULY 15.

Bradford Photo. Soc. Outing—Fountains Abbey.
Edge Hill C.C. Outing—Blundellsands and District.

MONDAY, JULY 17.

Royal Phot. Soc. "The Amateur Photographer and Photography" Prize Competition Prints.
Southampton C.C. Demonstrationettes.

TUESDAY, JULY 18.

Hackney Phot. Soc. Desensitol. J. Jevans. Barnet Matt Plates. W. Selfe.
Bournemouth C.C. Outing—Golf Links and Talbot Woods.

WEDNESDAY, JULY 19.

Rochdale Amateur Phot. Soc. "Satista" Demonstration. A. E. Cooper.
Bournemouth Camera Club. Outing to Isle of Wight.

THURSDAY, JULY 20.

Sheffield P.S. Outing to Grenoside.
Hackney Phot. Soc. Outing to Stanwell-in-the-Moor.

CROYDON CAMERA CLUB.

Mr. L. J. Hibbert gave a practical demonstration on "The Making of Colour-Screen Plates." He started to the sound of corks popping, perhaps the cheeriest sound in Nature, which outside was making good with a wind-driven temperance deluge.

Many will remember the old Thames plate, capable of really good results (at intervals), with which he was associated on the technical side. Two members of the club, Mr. John Keane and Mr. S. J. Tayler, employed the plates largely in night photography to illustrate a lecture given by them at a Convention meeting held at Exeter some years ago, and favourable opinions were expressed at the rendering of the colours photographed under artificial illumination.

One gathered from what Mr. Hibbert said that the financial side was the primary cause of the disappearance of the forerunner of the Paget plate. If the Autochrome be any criterion, on which one hundred hands were engaged for seven years before it saw the light of day, preliminary research and experimenting must be prolonged and necessarily very costly. He paid a high tribute to the work of Messrs. Lumière. The Autochrome plate was indeed a wonderful achievement, and possessed the advantage of giving a direct colour positive by simple chemical procedure. Also, correction had never been sacrificed to speed.

Whirlers, micrometer registering frames, and other appliances actually used in the making of the Thames plate (the first one on the market with a regular screen formation, the Joly screen excepted) were then shown in operation, and the method of manufacture clearly explained. A hearty vote of thanks was accorded Mr. Hibbert for an evening full of interest.

News and Notes.

PHOTOGRAPHIC CONVENTION.—At the annual general meeting, held at Shrewsbury last week, it was resolved to hold next year's meeting of the Convention at York.

BURGLARS' NEW IDEA.—At Clacton-on-Sea last week burglars broke into a cinema and stripped the operating machines of their lensers and condensers. Loss and damage are estimated at £250.

"CAMERA HOUSE JOURNAL," Messrs. Butcher's trade house organ, gives in its July issue particulars of new goods, including a series of developers put up in bottles which are stamped with ½-oz. markings.

XL PHOTOGRAPHIC SUPPLY, 238, Railton Road, Herne Hill, London, S.E.24, send us some excellent specimens of their work in black and sepia postcard printing. They make a specialty of prompt dispatch, and their price is the same for black, sepia and vignetted prints.

CITY SALE AND EXCHANGE.—A 68-page list from the branch at 54, Lime Street, London, E.C.3, is specially assigned almost exclusively to professional apparatus, and lists an immense number of field and studio cameras, anastigmat, rectilinear and portrait lenses, and a considerable variety of shutters. Obtainable free on application.

MESSRS. Ross, LTD., have recently opened a branch establishment at 100, Deansgate, Manchester, under the management of Mr. A. S. Havart, hitherto the firm's outside representative in London. Mr. Havart will be pleased to place his knowledge of the various Ross manufactures at the disposal of dealers and others in Lancashire and the North.

HOUGHTONS' PROFESSIONAL BULLETIN.—In the July issue Mr. Alexander Mackie conveys some lessons on the legal relations between a photographer and his customer in a vein of fiction. Messrs. Houghtons' write in a strain of optimism as regards improvement in trade and the disappearance of German competition, and the commercial notes announce a further reduction in the price of plate-sunk mounts.

MESSRS. CAMPBELL-GRAY, LTD., inform us that they have been appointed the sole official photographers to the British Empire Exhibition, from this date until the opening, and during the run of the Exhibition in 1924. The concession is to include the taking of all and any kinds of photograph in the Exhibition, selling of such photographs, and the selling of photographic apparatus, materials and appliances.

PHOTOGRAPHY BY THE SEA.—Messrs. W. Butcher and Sons, Camera House, Farringdon Avenue, London, E.C.4, are issuing to dealers, at the price of 2s. 6d. per 100, an attractive booklet on the opportunities of seaside photography, written by Mr W. L. F. Wastell, whose personal and photographic qualifications are summed up in the description "expert photographic humorist." It is emphatically a booklet for the dealer's counter during the next few weeks.

PROFESSIONAL PHOTOGRAPHIC PRINTING ASSOCIATION.—In sending us their price list for bromide enlargements and contact prints and other descriptions of work for professional photographers, this firm mentions that the principal, Mr. John Done, is probably the oldest photographic printer in active work, having begun his connection with the trade by employment with Elliott & Fry in 1865, and having been engaged as a trade printer from 1871. The price list may be obtained free on application to 115, Queen's Road, Bayswater, London, W.2.

CAMERAS AT FOLKESTONE.—Cameras are more numerous than ever at all seaside and health resorts this year, even though the true holiday season has not yet started. A correspondent who is visiting Folkestone states that during a bright morning last week he took a walk along the Leas eastward to the Harbour Pier, returning by way of the beach and the new zig-zag path, when he counted 131 cameras, being carried or in use. As far as could be ascertained, the patterns of the cameras seen were:—Folding film, 62; box-form film, 27; folding plate (including film pack), 10; box-form magazine, 10; reflex, 8; and miscellaneous, 14. There were three film users to every plate user. As the Folkestone season is not yet at its height, it may be assumed that the numbers given above may very soon be trebled.

NORTH YORKSHIRE AND SOUTH DURHAM PROFESSIONAL PHOTOGRAPHERS' SOCIETY.—The third meeting was held at Mr. Sidney H. Wood's Studio, Darlington, on July 4. The Society is now firmly established, and includes among its members all the well-known photographers of the district. After the business was disposed of, light refreshments were provided, and then Mr. Wood conducted the members round the several departments of his business, and explained his methods of working. Mr. Wood also gave a demonstration with several pieces of his apparatus, which included the most up-to-date appliances. This was thoroughly enjoyed by the members, and a very hearty vote of thanks was accorded Mr. Wood for a most interesting and pleasant meeting. The hon. secretary is Mr. Albert E. Ba[illegible], Bishop Street, Stockton-on-Tees.

Commercial & Legal Intelligence.

NEW COMPANIES.

INTERCHANGEABLE LENS CO., LTD.—This private company was registered on June 30 with a capital of £3,500 in £1 shares. Objects: To carry on the business of wholesale opticians, lens makers and edgers, manufacturers of and dealers in machinery, tools, engines and plant required for use in connection therewith, etc., in any part of the world. The permanent directors are:—E. A. Archer, Mapleton, Forfis Green, N.2, optician; H. L. Taylor, Fernleigh, Station Road, Solihull, Warwick, optician; A. E. Symons, 320, St. John Street, E.C.1, C.E.; C. B. Ustonson, 47, Hazelwood Lane, Palmers Green, N.13, optician. Qualification, 50 shares. Registered office: 10, Clifford's Inn, Fleet Street, E.C.

C. ROBINSON CENTRAL PHARMACY, LTD.—This private company was registered on July 1 with a capital of £300 in £1 shares. Objects: To acquire from C. Robinson the business carried on as The Central Pharmacy at Aire Street, Knottingley, and to carry on the business of chemists, druggists, stationers, opticians, dealers in photographic goods, etc. The first directors are:—W. E. Milburn, Hill Top, Knottingley, chemist and druggist; C. Robinson, Hazelmere, Park Avenue, Castleford, drug-store proprietor; Mrs. L. Robinson, Hazelmere, Park Avenue, Castleford. Qualification, one share.

LEADLAY, LTD.—This private company was registered on July 1 with a capital of £2,000 in £1 shares. Objects: To carry on the business of advertising specialists and publicity agents, advertising contractors and agents, designers, blockmakers, engravers, photographers, photographic printers, photo-lithographers, printers and publishers, etc. The first directors are:—E. O. Leadlay, 55, Ashburnham Mansions, Chelsea, S.W., advertising specialist; F. P. Walker, 15, Ellsworthy Terrace, N.W.3, organ builder. Registered office: 61, Berners Street, W.1.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

VIEW POSTCARDS.

To the Editors.

Gentlemen, I should like to endorse most of what Mr. Tardrew says in his letter to you, published in the "B. J." of the 7th inst. British photographers have, I fear, let the picture postcard trade slip through their fingers, and it is now too late to recover it or to make the publication of view-postcards a profitable undertaking. A considerable amount of apathy has been shown by the local worker, with the result that the big firms have stepped in and captured the cream of the trade.

There has been a lack of enterprise on the part of local workers, and not 5 per cent of the postcards now being sold at popular seaside resorts are from negatives made by local photographers. A visit to three South Coast towns only last week opened my eyes as to the present state of the view postcard trade. The sales of

the 9d.-per-dozen variety are brisk enough, but they are of little or no interest to the photographer, the cards being by one of the photo-mechanical processes. "Real photograph" cards such as the local worker would produce are not in demand, their cost being too high. Although of fairly good quality, the subjects pictured on the cheaper cards leave much to be desired, and many are out of date; their antiquity, however, does not spoil their sales, the average tripper not being a good judge of quality.

Many years ago—sixteen to be accurate—I visited one of the Continental establishments producing postcards, when I saw thousands of postcards being printed, cut up, and despatched to England, and I then realised how useless it was for a British professional to attempt competition with the large Continental firms, who at frequent intervals send their own operators to our shores or purchase negatives from our own countrymen, in order to keep their sets up to date.

To play about with the view-postcard or to run it as a side line means loss of money, time, and temper, more especially at the popular holiday resorts, where the shops are already overstocked and cards are being offered at cut prices. In Folkestone, for instance, I saw the same cards in three streets being sold at 8½d., 9d., and 10½d. per dozen, or 1d. each if purchased singly.—Yours faithfully,

G. J. HENDERSON.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

C. N.—"Treatise on Practical Light," by Dr. R. S. Clay, 563 pages, Macmillan, 12s. 6d. net, is, we think, quite the best book of the kind you require. It describes a lot of experiments with very simple apparatus.

W. H. S.—If the hypo and metabisulphite are of proper quality there is no reason why the plates should not fix quickly. The only explanation we can think of is that plates were exposed to white light before fixing. Some plates are rather susceptible to this; that is to say, do not fix rapidly if exposed to white light before going into the fixing bath.

B. Y.—We believe the 5-portrait studies are taken with a set of three mirrors. So far as we know there are no particulars published of how to arrange the mirrors; that is a matter of trial according to the circumstances. The Tress Co. used to supply sets of mirrors for these portraits, and no doubt if you wrote to their successors, Eveling and Tress, Ltd., 4a, Rathbone Place, Oxford Street, London, W.1, they would be able to supply you.

P. J.—We are afraid there are no purchasers of photographic relics. We think the best thing you could do would be to present the negatives to some institution which would take care of them and keep them for the use and interest of photographers. For example, the Liverpool Amateur Photographic Association, 11, Dale Street, Liverpool, or the Royal Photographic Society, 35, Russell Square, London, W.C.1, both of whom have a museum in which many objects of historical interest in photography are preserved.

H. L.—(1) Most rapid plates have a tendency to be somewhat coarse-grained, but in none should it show in the print. We should advise you to use isochromatic plates, to give full exposure, and to develop with a rather weak developer. We should imagine that your eyes suffer from astigmatism, in which case you should have them tested by a good optician and proper glasses fitted. (2) Approximately grainless negatives can only be made on very slow plates, but most of the best portrait work is now done with plates of 400 to 500 H. & D.

NEWSPAPER.—Your letter heading does not bear your address, so that we cannot reply to you by letter. An average fee is 10s. 6d. per subject, but you do not appear to be aware that you have no rights whatever in the photographs, since they were taken to the order of your customer, and therefore the latter is the owner of the sole copyright. If your customer likes, he can take action against the newspaper for infringement of his copyright, and also would have good ground for proceedings against yourself, if not as regards copyright, at any rate, as regards breach of implied contract.

C. G.—About the best stop bath for bromide prints is a very weak solution of acetic acid, about 1 dram of acid in 30 ozs. of water. As this is a weak bath, plenty of it should be used, as the acid becomes continuously neutralised by the alkali passing into the bath with the prints. At the same time it is best not to use a stronger bath. We ourselves think there is very little object in using a stop bath at all. It is a mistake, we think, to develop prints in such a way that they have to be snatched out of the developer and its action suddenly stopped in order to prevent it from going further. Much better to give such an exposure that the prints will practically not develop too dark, however long they are left in the developer.

E. B.—It is not necessary to have the sheets, which you use for reflecting and diffusing the light, very long; 2 ft. should be enough. As a substitute for the expensive reflectors you might make D-shaped reflectors of card, with thin nainsook or madapolam fronts. If you take a six-sheet imperial board, 31 x 21, and bend it so that the edges are 17 in. apart, securing them with string or wire at top and bottom, and then sew the fabric to the edges so that you have a flat front 21 high and 17 wide, you will find it answer every purpose. You must keep the lamp quite central to avoid scorching. If you are satisfied with the results you could have the apparatus made of tin at a small cost. We have used a set of six such lanterns for six months, and only had one card slightly scorched. You can suspend them from the "flex" with strong string.

C. S.—It is not possible to form any opinion of the cause of the fog, particularly in the absence of any of the negatives. You seem to think that the fogging may be due to a particular conjunction of slit width and lens aperture, but we do not think that there is anything in these variations which has anything to do with the cause of the fog. If the fog is caused in the camera, the edges of the plate which are covered by the rebate of the dark-slide ought to be practically clear glass. If this is so, then the cause is most probably to be sought in the lens or camera. The former may be suffering from a species of flare, which causes general veil, or the camera may have parts in it which scatter light on to the plate. It is almost impossible even to guess at the cause without examining the camera. If the whole plate, including the edges, is fogged, then the cause is probably in the development, not necessarily the dark-room illumination, which from what you say appears to be all right, but perhaps a faulty composition of the developer or impure chemicals.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. **ESTABLISHED 1854.** **PRICE FOURPENCE.**

TERMS OF SUBSCRIPTION POST FREE.

UNITED KINGDOM OR CANADA.—*One Year*, £1 1s. 8d.; *Six Months*, 10s. 10d.; *Three Months*, 5s. 5d.

ANY OTHER PART OF THE WORLD. *One Year* ..... £1 3s. 10d. *Six Months* ... 12s. 0d. *Three Months* 6s. 0d.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibits the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3246. Vol. LXIX. FRIDAY, JULY 21, 1922. Price Fourpence.

Contents.

SUMMARY

The paper by F. M. Walters, jun., and R. Davis, giving the results of a study of colour-sensitising plates by bathing, deals with the use of dicyanine and the orthochromatising sensitisers, and also with the hypersensitising of commercial panchromatic plates. There is a note on the increase of speed by washing before exposure, and the authors describe in detail the procedure and method of drying to be followed in colour-sensitising by bathing. (P. 430.)

Mr. A. Lockett describes a modification of Mr. W. E. Debenham's method of measuring focal length, which takes account of the (small) error due to neglect of the nodal space. (P. 434.)

In a note on toning with tin salts, Mr. J. G. F. Druce describes experiments to show what takes place when a bleached print is toned with an alkaline tin solution. (P. 433.)

M. L. P. Clerc describes some new apparatus which has recently come upon the French market, and refers to the very pleasing work with semi-corrected lenses recently shown in Paris by Commandant Puyo. (P. 427.)

In a leading article we deal with the opportunities for effective portraiture which present themselves in ordinary rooms, and may be well utilised provided that the possibilities are realised in comparison with those of an ordinary studio. (P. 426.)

In a contributed article, Mr. H. J. Comley urges a more progressive spirit among photographers—for example, in the utilisation of the most recently available methods of negative-making and printing. (P. 428.)

Mr. E. A. Dench gives a description of a number of window displays used by dealers in the United States and Canada for attracting business in the development and printing of amateurs' films. (P. 429.)

A person who carries on a business in a name other than his own is required to register that business, even although it is a branch of a business in the same town which is carried on under the person's own name. Such, at any rate, is our interpretation of the Business Names Act. (P. 425.)

Opportunities for commercial photography to the order of collectors, etc., may often be found even in towns which have not the industrial demand for this kind of work. (P. 426.)

The Professional Photographers' Association has begun the publication of its monthly "P.P.A. Record." (P. 425.)

The term "matt" in reference to printing papers includes several distinctive surfaces, some of which are ideal for small portraits. (P. 426.)

Still another process for the dye-toning of transparencies has been patented—by a German firm. The silver image is bleached with quinone, first used and patented for this purpose by MM. Lumière. (P. 426.)

An automatic film camera for aerial photography is the subject of a recent patent specification. (P. 436).

EX CATHEDRA.

The P.P.A. Record.

It is, perhaps, natural that the Professional Photographers' Association should feel the need of an organ which should allow it to address its members fully regarding the movements which are taking place within the Association, and also should deal with certain matters exclusively from the standpoint of the professional photographer. The first issue of the "P.P.A. Record," which has been established with these aims, as we understand them, has at length made its appearance. Its pages afford ample evidence of the sincerity and energy with which leading members of the Association are devoting themselves to the affairs of that body and, in particular, to the arrangements for the Congress which, in September next, will celebrate the twenty-first birthday of the Association. Possibly, domestic concerns will occupy a smaller proportion of space when the "Record" has got fairly into its stride. As a journal seeking to influence professional photography as a whole, it necessarily must consider those who are without as well as those who are within the P.P.A. We are confident that its object is to exercise a thoroughly healthy influence, and therefore we wish it every success. If any criticism is to be expressed of this first number, it concerns chiefly the indecision of the typographical setting. There are too many kinds and sizes of type. The "Record" should surely offer to its readers a better example of tasteful printing.

* * *

Registration of Business Names.

A question which has recently been put to us by a correspondent in reference to the application of the Registration of Business Names Act no doubt arises in other cases, and may, therefore, be noticed here. Our correspondent carries on a business under his own name, and is establishing another which he intends to carry on under a name not his own. He asks whether it is necessary for him to register the latter business. Although the Act does not specifically refer to such a case as this, we think that undoubtedly registration of the second business is required. The object of the Act is to disclose to the public the real names of the people with whom they are dealing in entering into transactions with any business firm, and the fact that a particular business is a branch of another (the ownership of which is published) does not conceivably afford any ground for exemption of the former from the provisions of the Act. Inasmuch as it is not uncommon for a photographer to have two businesses in a town, one under his own name and another, of a cheaper character, under a fancy name, it is well that the requirement of the Act in this respect should be borne in mind. While we are referring to the Act, it may be mentioned that the offices of the Registrar of businesses in England and Wales has recently been removed from Russell Square, to 3 and 4, Clement's Inn,

London, W.C.2. The Edinburgh office is still at Exchequer Chambers, Parliament Square, and the Registrar of Irish businesses is still, presumably, to be found at Coleraine House, Dublin. Forms of application for registration may be obtained from these addresses.

* * *

The Surface of Small Prints. When albumen was the only surface for photographic prints the photographer had little opportunity for going astray in his choice, the only difference being between single- and double-coated papers. The great variety of surfaces now available in bromide and gaslight papers, while rendering it easy for the thoughtful worker to select one suitable to the work on hand, may lead another less careful to use a totally unsuitable surface, because it is ready to his hand. Really, glossy surfaces are not now admitted in good class portrait work, but there is a wide range to select from before a heavy dead matt surface is reached; and in choosing a surface it must be remembered that it is the size of the face and not the area of the print which has to be considered. There are now many grades of paper which are just not dead matt, ranging from ivory to satin, and these will be found very serviceable for single full lengths or small groups. The surface of some of the "matt" self-toning collodion papers is as near the ideal for small work as can be imagined. There is no gloss, yet there is no suspicion of blocking up in the shadows.

* * *

Quinone Dye-Toning. The Aktiengesellschaft für Anilin Fabrikation has added its name to the long list of those who have taken out patents for processes of dye-toning, and in so doing have utilised the observation, originally made by MM. Lumière, that a silver image is partially bleached by a solution of quinone, the gelatine, at the same time, being definitely hardened. Their process, according to the abridged particulars of the patent specification, No. 180,292 (which is open to inspection before acceptance), consists in treating a print for ten minutes with a solution of benzoquinone or naphthoquinone, mixed with potassium chloride or bromide. The print is briefly washed and then immersed in a solution of safranine and acetic acid, after which it is cleared with sodium bisulphite. The silver compound formed by the quinone bleaching solution may be removed as in other dye-toning processes. It would certainly seem that the mordanting of a dye upon a silver image which has been bleached with a solution of quinone is a fresh contribution to the knowledge of dye-toning. Nevertheless, it is difficult to see in what way the process as a whole can avoid the patent granted to MM. Lumière for the use of quinone in conjunction with bromide as a toning preparation. On the other hand, the latter's British patent, No. 25,751 of 1910, has now probably not long to run before its expiry.

* * *

Commercial Work. Not every photographer is alive to the importance of commercial work. This class of work has often to be sought out, and a well-worded circular, directed to the proper quarters, may bring in considerable business. The scope of the business will depend on the locality, and in the absence of manufactures there may be dealers in the fine-arts and books who are constantly wanting photographs for advertising or sale purposes. Also, and this may prove the most remunerative source, there are amateurs and collectors who can easily be persuaded to have their treasures photographed. It would be an easy thing for a photographer to find out who are the dillettanti in the neighbourhood who collect first editions, Chelsea ware, or Charles II. silver. Professional musicians, and some of the best amateurs, are likely to possess an old violin or 'cello of value. Study of the local newspapers, attendance at local concerts, bazaars, etc., will provide much of this information, or even friendly communication may be made with the dealers. The circular might point out to the collector the advisibility of a record of valuable objects, the danger of destruction, and so on; to the dealer, the commercial advantages of a photograph of every object of value which passes through his hands, to be kept with the record of purchase and sale, etc., will appeal. When dealing with a business man, a frankly commercial attitude on the part of the photographer, with a strict system of costing, should be adopted.

THE POSSIBILITIES OF ORDINARY ROOMS.

THERE is an evergrowing tendency to dispense, for various reasons, with the orthodox glass-roofed studio for portraiture, and to endeavour to make the best of premises which are otherwise desirable, but which have no top light. This was done in the early Daguerreotype days, and with the enormous increase in plate speeds, the problem of lighting should not be a serious one, if the photographer is willing to limit his poses to those which can be successfully handled under such conditions.

The very poor results which are often produced, even by skilled studio portraitists, when working in an ordinary room, are probably due to the photographer starting on his work with a settled conviction that the place is unsuitable and that nothing approaching a studio portrait can be obtained in such confined quarters. This is a great error, as many successful workers have proved. If Rembrandt had disdained the lighting given by the narrow windows of his father's mill, the artistic world would have lost the grandest lessons in concentrated lighting which have ever been given. The moral to be deduced is obvious; it is to work on the lines of least resistance, that is to say, to make use of such effects as are naturally produced, and to avoid straining after effects which can only be obtained in an open light.

The work that has been done with a concentrated artificial light should point the way to the use of a single window. When it is remembered what Van der Weyde did first, and hundreds have done since, with a four-foot umbrella-shaped reflector, fitted at first with a single pair of carbons, why should we look askance at a window six feet high and four broad illuminated with God's daylight? It is true that the reflector is movable and the window is fixed in its position, but we still have two factors, the sitter and the camera which can be moved at will.

It is a great mistake to think that much longer exposures are needed when working with a small source of light. This leads many to be afraid of controlling such a light, thus obtaining an over-lighted effect, which would not be so easily produced with the broader lighting and more generous space of the usual studio. The fact is that when a sitter is placed near an ordinary unscreened window, the light is far too strong, hence the chalky half-black-half-white faces which are so often seen.

As a rule, the ordinary window gives too low a light. As the glass extends to about thirty inches from the floor, there is a lack of shadow beneath the brows, nose and lower lip, and the eye nearest to it is suffused with light. This is easily overcome by fixing a shutter or dark curtain so that no light is admitted below four and a half feet from the floor. If the light be dull the upper

part may be left unscreened, but in a bright light a thin muslin curtain should be drawn across it. Provided that the top of the window be not less than seven feet from the floor, the conditions are now entirely favourable for everything but standing figures, which cannot be essayed with any reasonable hope of success. There is little practical utility in giving specific instructions for placing the sitter and the camera to produce certain effects. The first lesson the portraitist has to learn is to use his eyes; failing this power, volumes of instruction are useless.

The reflector plays an important part in the class of work under discussion, for as all the light is emanating from one source, reflected light must be largely employed to give shadow detail. For this reason the walls of the room should be light in colour, and not of a red or yellowish tint. A light grey is the most suitable; white or the very palest grey is chosen for the movable reflector.

Due consideration must be given to the size of the camera and the focal length of the lens, these being dependent upon the working space available. In a small room a large camera and lens will seriously curtail the opportunities for obtaining a variety of poses.

If full length, standing, poses have to be taken, unless the room be unusually lofty, say, eleven or twelve feet to top of window, artificial lighting must be resorted to, and in the majority of cases half-watt lamps will be found the most convenient. They may be used in conjunction with daylight or alone. If used to supplement daylight, a couple of 1,500 c.p. bulbs, fixed near the ceiling in a line with the edge of the window which is nearest the camera, will do all that is needed, but, if to be used alone, at least six 1,000 c.p. bulbs will be needed with facilities for raising and lowering them. When it is to be used independently, a more advantageous position than that indicated may be found. Very often a room only 12 or 14 feet wide at the window side extends back 18 or 20 feet, and it is then desirable to make use of the greater length.

A small background frame, say, 6 feet 6 inches by 4 feet, fixed upon brackets with castors, will add greatly to the ease of working. On one side, a medium grey plain ground may be stretched, and a light grey or white upon the other. A very dark curtain, suspended from a rod at the top of the frame, will complete the outfit.

As it will often be necessary to work with the lens pointing towards the light, an efficient hood should be fitted to the camera. A very good form is a wire frame fixed to the top of the camera and projecting about a foot beyond the lens; upon this, dark curtains are fixed at the top and sides, the latter being arranged so as to draw round in front until only such light as will reach the plate will pass. This will greatly help, too, in the production of bright negatives.

PARIS NOTES.

Photographic Processes.

I was interested in obtaining evidence recently of the success which has followed the advocacy by some of the French photographic journals of the more extended use of orthochromatic methods among both professionals and amateurs. In conversation with M. E. Grieshaber, the technical head of the "As de Trèfle" plate-making firm, I learnt that the proportion of orthochromatic plates made in his works is now 50 per cent. of the total as compared with 5 per cent. ten years ago. He recorded also a much wider use of anti-halation plates and did not doubt that his experience was also that of other manufacturers.

In a former note ("B.J.," May 19, 1922, p. 294) I referred to the process of M. F. Monpillard for the extra-sensitising, as regards both general and colour sensitiveness, of emulsions by bathing. The first trials which have been made of this method have shown that it is not the easiest to work. It seems that failures are due to the fact that the silver chloride, or its solution in ammonia, may have been exposed for a short time to light.

M. Louis Lumière has recently published an ingenious method of washing negatives, permitting of this process being carried out in a very short time and with a minimum consumption of water. A fluid ounce of water is sufficient for washing a quarter-plate in 12 to 16 minutes. The process is as follows:—Upon a board, which is placed almost upright, there is fixed a sheet of glass and then a length of absorbent cotton fabric, the upper part of which dips into a small vessel filled with water, whilst the lower part communicates with any receptacle. Under the influence of capillary attraction the strip of fabric forms a kind of siphon, which slowly discharges the contents of the upper vessel into the lower. By laying the negative face down on this fabric, there is a constant passage of the water through the gelatine and a rapid removal of the soluble salts. It is advisable that the negative should be previously treated in an alum bath in order to prevent the texture of the fabric from impressing itself upon the surface of the negative.

Some sensitometric tests have recently been made in the laboratory of the Estienne Municipal School (connected with the book industry) by L. P. Clerc. They show that with wet-collodion plates the reciprocity law may be considered as holding good. Attempts made to determine the value of the Schwarzschild exponent showed that this latter may be considered as practically equal to 1.

Some New Introductions.

German cameras have again appeared in the French market, where they are frequently offered as second-hand, as a means of disguising their recent importation. Several new firms in the manufacture of cameras, particularly the Gallus Usines, the Noxa Company and the firm of Baille-Lemaire are combating this competition with considerable courage and have afforded evidence of their manufacture of many cameras of excellent design and construction at very moderate prices.

A print-drying machine of the endless web pattern, but of smaller size, has been produced in France for the French Kodak Company from the design of the manager of the firm's finishing department, M. Jelinsek the original inventor of machines of this kind. In the present model the lengths of fabric successively envelop two heated cylinders, the temperature of the second being greater than that of the first. The band of fabric moves round the second cylinder in a direction opposite to that in which it moves round the first. One of the first of these machines has been acquired by the Aviation Service and will be officially shown in the international exhibition of aerial photography, which is to be held at Brussels from June 23 to July 9 under the auspices of the Aero Club of Belgium. The machines have been supplied to Kodak, Ltd., London, so that a full description is unnecessary.

At the Paris Fair a Parisian instrument maker, M. E. Piquet, showed a quartz "boiler" for the rapid electrical heating of liquids. It consists of a tube of quartz curved in the shape of an elongated horseshoe and forming an electric resistance. Simply by immersing it in the liquid to be heated, the latter may be brought practically to boiling without danger of in-

juring the "boiler" or contaminating the liquid. The accessory is one which will be extremely convenient in the preparation of solutions and particularly for bringing working baths to the required temperature.

Half-watt lamps, overrun or run at their proper voltage during the actual exposure, have made considerable strides among portrait studios, and two types of equipment have recently been presented to the studio of the French Photographic Society and tested there with success. These are the Philipps Photoclar lamp and a ceiling lamp with vertical diffusion introduced by the firm of Leacap.

The Puyo Exhibition.

Since the war we have been far from being surfeited in Paris with exhibitions of pictorial photography, and thus the collection of works by Commandant C. Puyo, which has been arranged by the French Photographic Society, has met with great success, as did also the meeting at which this well-known artist discoursed upon the prints shown on the walls. In addition to examples of the gum-bichromate process, the collection includes oil prints, both direct and transfer. M. Puyo is of course well known as the pioneer in the use of anachromatic lenses for pictorial work, and he went to a good deal of trouble in classifying his prints in order to show the particular description of lens employed in making the negatives. Among the most interesting of these simple objectives is a plano-convex lens, the curved surface of which faces the subject, a diaphram of f/7 being placed behind. It serves excellently for large heads, and if turned the other way about gives somewhat inferior definition but then covers a wider field more evenly and is useful for head and shoulders portraits. A symmetrical objective consisting of two single meniscus lenses, working at f/5, is suitable for somewhat out of focus portraiture at its full aperture, and at f/7 gives more critical definition, which was well displayed in some photographs of interior subjects. In landscape work, in order to get sufficient depth of focus M. Puyo is of opinion that, whatever the focal length of the lens, the diaphram should not be larger than one inch diameter. His best results were obtained with the lens recommended by De Pulligny as the "adjustable landscape lens," consisting of two glasses, the front one plano-convex and the rear one plano-concave, both of 4 in. focal length and having their flat surfaces facing one another. In portraiture his best results had been obtained with a telephoto which he fitted up for himself by using any negative lens behind a Petzval portrait lens. He preferred to use a camera having a mid-way lens board or frame on which the negative lens could be mounted, whilst the positive portrait lens was attached to the usual lens front.

Without exception, in the use of these anachromatic lenses, it is necessary to bring the plate slightly nearer to the lens after having focussed in order to compensate for the difference between the visual and chemical rays. The amount of this shift may be ascertained once and for all for each lens and as a rule is 1-400th. of the camera extension.

L. P. Clerc.

EFFICIENCY IN PROFESSIONAL PHOTOGRAPHY.

Of late years much has appeared both in the daily Press and in various technical journals dealing with the need for higher efficiency and improved methods of production in every important industry. No industry, whether high or low in the scale of national importance, can afford to neglect the employment of means which may be calculated to increase its value as an industry and the value of its particular productions in the commercial world. Photography is certainly not now among the least important of our national industries. Its value for naval and military purposes became so increasingly obvious during the late war that it is difficult now to realise how it would be possible to conduct a successful campaign without the aid of a camera. Its employment is recognised in various departments of important industries, such as railways, shipbuilding yards, engineering works, printing offices, etc., many of which now have their own photographic department and staff; to say nothing of the great world of advertising, and the exceedingly important part which it plays in the reproduction of illustrations in books, magazines, and newspapers. This evidence alone must satisfy the most contentious critic that photography has already established itself in an unassailable position in our national commercial life, and that it is impossible to set limits to the opportunities which are still presented to it, or to calculate the sum of the value to which it is capable of attaining This being admitted, it is clear that workers in this important industry should aim at the highest efficiency of which they are capable, not only that they may enjoy a congenial and lucrative employment, but that, by their efforts, they may assist in continuing the advancement of which we have been the contemporaries.

Photographers as a class have never been too eager to take up fresh methods and new ideas. Generally speaking, new ideas have brought with them their own workers as well as their own exploiters and capital. The older hands have been content to jog along in their old time-worn rut, and to leave to others the pleasure and profit of the newer and more refreshing pastures. How persistently the photographer of twenty to thirty years ago refused to have anything to do with the amateur trade, and so allowed this lucrative business to fall into the hands of the chemists, who reaped the rich harvest which photographers should have enjoyed. If we come to the consideration of more recent opportunities, we find the same negative spirit in the manner in which the professional photographer has neglected cinematography and colour photography. Granted that the latter has not yet arrived at a stage when simplicity of manipulation or uniformity of successful results upon paper has made it a particularly attractive proposition for professional exploitation; still, the fact must not be overlooked that a few courageous enthusiasts have made it a profitable department of their businesses, and it is probable that a greater demand for materials for colour work would have encouraged manufacturers to still greater efforts. A serious study of the art of colour reproduction, or even of the more simple processes of correct colour rendering in monochrome, would give many an old photographer a new interest in life, and a new zest for the craft in which he now foolishly thinks there is nothing more for him to learn. Real life is ever an onward progress; we either progress or decay, and if we would get the most out of the life we live, to enjoy it fully, we must taste of its new joys and bear its new burdens; we must embrace opportunities as they present themselves.

Then again, it would surprise anyone who took the trouble to ascertain facts how very few professional photographers have any real practical experience in the use of panchromatic plates and the various light-filters with which these plates may be used for the rendering of colour in monochrome. Many have dabbled in panchromatic work, but comparatively few, apart from those who are exclusively engaged in commercial photography, have become its enthusiastic votaries and made it a regular feature in their businesses. The writer has had it remarked to him by one of our leading portraitists, "I am too busy making money with the plates I am familiar with to bother about taking on new methods of doing the same thing," an expression which may

be regarded as typically British in its sentiment, but none the less to be deprecated and deplored by all who have the future development of photography at heart. So many are only too eager to take all they can get out of photography but are unwilling to make an effort to put anything into it in return, in order that others may gather some of the fruits of their experience. How manifestly unfair it is to keep assistants working at obsolete methods and with out-of-date materials, and not to allow them to have the opportunity for making progress in their craft. Every pupil or apprentice has the right to expect that he will receive instruction in all the most modern methods and processes; and an important clause in his agreement should be that he would be given the opportunity to thoroughly master the theory and practice of panchromatic work. The assistant of the immediate future will be seriously handicapped in his advancement if he has not this training implanted and well rooted within him. The assistants of the writer for the past sixteen years have had the greatest possible encouragement to familiarise themselves with this work both for printing in monochrome and tricolour, and all of them would, I believe, endorse the opinions now being expressed. I have no desire to overestimate the importance of the use of panchromatic plates, but I submit that no one can lay a just claim to being an expert operator to-day unless he has had practical experience in panchromatic work. I am fully aware that any change to new processes or methods of manipulation is regarded as somewhat revolutionary, and therefore objectionable in an old-established business, but in the many new businesses which have opened up since the war, and also in the many older businesses which have changed hands in recent years, there can be no such excuse for continuing in the old worn paths simply because they are familiar and well trodden, but every valid reason why one should expect to find in these businesses the evidence of reconstruction upon up-to-date lines. You owe it to yourselves, to your assistants, and none the less to your patrons, that each and all of you should benefit by the constant progress which is being made in photographic methods. Let the rising generation of photographic craftsmen be craftsmen indeed, and not merely commercial exploiters; let them aim at making photography a craft to be looked up to with respect, and with which any man may be proud to be associated. This will only be done by assiduous effort on the part of those who love their work for the work's sake, and who really have the future of photography at heart.

HENRY J. COMLEY.

GETTING MORE PRINTING AND DEVELOPING WORK.

SERVICE and good work are the two things that count in photographic developing and printing. These two things should form the subject matter for attractive window displays, whether you do the work yourself or send it out. Some American examples along these lines are given below :—

Sam Schwartz, Newark, N.J., U.S.A., employed window strips to convey the following messages : —

"Do we develop? YES."

"Films? We have them."

The Big League Sporting Goods Co., New York City, stimulated business over a stated period by a special offer. The woman purchasing the largest amount of cameras and supplies, and having the most printing and developing done, by May 29, was presented with a large fur-clad kewpie doll. This offer was given considerable window card publicity. Each card bore the following reminder : "Get Busy Girls." The kewpie doll formed the central window exhibit.

Meeker's, Danbury, Conn., had a very attractive window card, which bore the sketch of a puppy pulling the film out of a camera. The card was captioned :—

"Developing and Printing for Amateurs."

The National Drug Co., Chicago, Ill., went after the business of office workers with the window card as below :—

"Leave your films to be developed on your way to business.
They will be ready when you go home."

Cunningham's, Detroit, Mich., conveyed the difference between printing work done by them and by another local concern. A large card at the front of the window was divided into two parts. Fastened to the top half of the card were several discoloured prints, with the caption above."

"There's a difference. Prints which have been improperly fixed. Note the discoloration."

The lower half of the cards contained a number of perfect prints, with the caption :—

"Below are prints made in our finishing laboratory a year ago. Note they are in the same condition as when first made. No discoloration. We give professional service."

Another display by Cunningham's, Detroit, Mich., contained a varied assortment of rolls and packs of film. The goods were exhibited on large glass stands. Attention to the display was called by a large cardboard arrow at the rear centre. The wording on the arrow was as follows :—

"Even if your size camera is not made any more, we have films for it."

Coy's, Wheeling, Ohio, even secure printing and developing work after store hours. They do this by means of a cabinet in the doorway, equipped with envelopes and a cavity for depositing one's work. The patron fills in the necessary particulars on one of the envelopes, places his film pack or rolls inside, and deposits them in the slot.

The Owl Drug Co., Portland, Ore., devoted a display to cameras and supplies, backed up by a large card containing several rows of numbers. The card stated that :—

"These are the LUCKY NUMBERS for this week. Get yours." The contest which extended for one month only, entitled the lucky customer to a free enlargement. One out of every fourteen orders was singled out in this manner. Each receipt for printing and enlarging was marked with a number, and those who held receipts with the numbers drawn received the free enlargements.

Cill's, Portland, Ore., have individualised their photographic department by a character creation called "Photo Phil," the body of which is pictured as a film roll, with short arms, legs and head. For window display purposes, this character creation was recently reproduced as a life size cut-out. One arm was raised, and this held a large piece of black cardboard with the caption at the top in red :—

"A Message for You."

An arrow underlined the words and pointed to a sheet of paper pasted on the cardboard beneath the arrow. The announcement, written on the firm's letter-head, was as follows :—

"DEAR KODAKERS,

"I have some good news for you! Each week, until October fifteenth, I will select the best negative out of those brought to me, make an attractive enlargement, and put it in the window Saturday, where it will remain over Sunday. After this, the prints and enlargements will be a gift from me to the photographer.

"At the end of the period stated, the best of the pictures exhibited in this way will receive a No. 3 Ansco Autographic camera!

"The only limitation to this contest is that the picture must be DEVELOPED and PRINTED by me.

"Hoping that this contest will inspire clearer and finer pictures,

"Cordially yours,

"PHOTO PHIL."

The figure of Photo Phil was made with a red body, green legs, flesh-coloured arms and hands. A blue velvet drape ran from the

figure to a stand, on which was a tripod camera. This, as a card proclaimed, was the "Grand Prize." At the left was a two-foot enlargement, fastened to a card, "Winner for this week."

The North Western Photo Supply Co., Seattle, Wash., covered the window floor with brown plush, with a large vase filled with fruit blossoms at the left side. Spread out on the floor were several playing cards, all hearts, with appropriate descriptions written on them. The first card, the ace of hearts, was entitled: "Your Kodak." The next card, the king of hearts, stood for "Eastman Film." The queen of hearts was "Our finishing department," while the Jack stood for "Art proof enlargement." The remaining card—the ten-spot of hearts—called attention to "Hand colonring by our artist." Behind the cards was the sign which proclaimed "An Unbeatable Hand."

Wakelee's Pharmacy, San Francisco, Calif., had a window display to emphasise their prompt developing and printing service. In the middle of the show, surrounded by cameras and supplies, was a cardboard clock dial, with arrows pointing to the hours between nine and five. Underneath the dial was the following sign :—

"EIGHT HOUR SERVICE.

"A cent a minute discount will be allowed customers for each minute, after eight hours, for delivery of films and prints."

E. A. DENCH.

STUDIES IN COLOUR-SENSITIZING BY BATHING.

[A scientific paper, No. 422, recently published by the Bureau of Standards, Washington, is that entitled "Studies in Colour-Sensitive Photographic Plates and Methods of Sensitizing by Bathing," by Francis M. Walters, junr., and Raymond Davis. As will be seen from its somewhat abridged text, which we reprint, it contains the results of numerous trials respecting the best method of using pinacynol and other colour sensitizers, *e.g.*, dicyanine, pinaverdol, pinachrome, orthochrome T. and homocol. It also deals with the increase of speed in panchromatic plates by washing before exposure.]

(*Continued from page* 419.)

Speed of Plates Before and After Bathing.

To study the camparative sensitizing action on plates having different characteristics as to speed and contrast, four plates made by the same manufacturer were selected, a fast plate, a medium-speed plate, a slow plate, and a process plate. The plates were

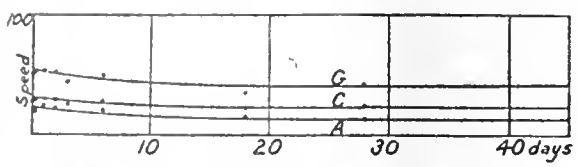


Fig. 5. Plates sensitized with pinacyanol and water.

sensitized in a bath containing pinacyanol, water, alcohol, and ammonia Table 1 shows the results obtained:

TABLE I.

Plate.	Initial speed.	Speed after bathing.	Speed with filters. A.	B.	C	G.
Seed 30 ..	500	315	26	29	28	66
Seed 26x ..	400	300	28	27	25	69
Seed 23 ..	180	135	19	17	21	47
Seed process..	31	29	6	4	2	10

These results indicate that more added sensitiveness is conferred by the dye bath on slow plates than on fast ones. It may be concluded that when speed is not the factor of prime importance,

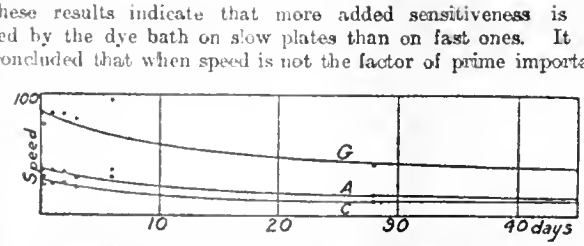


Fig. 6.—Plates sensitized with pinacyanol, water, alcohol, and ammonia. The *G* filter gives very nearly the added sensitiveness due to the dye. The *A* filter shows the red sensitiveness. The *C* filter shows the blue sensitiveness. If these curves be compared with those in Fig. 8, it will be observed that the colour sensitiveness does not decrease as rapidty with time as the sensitiveness to white light.

the plate chosen for bathing should be selected on the basis of its freedom from fog, its developing characteristics (contrast), and its resolving power.

Spectrograms show that the sensitiveness added by pinacyanol is about the same for the 30, 26×, and 23, although the blue sensitiveness which the plates had originally still falls in the same order as the speed before bathing. Relatively the process plate has acquired a much greater sensitiveness than the other three plates, although its actual speed is far below them.

It may be remarked here that the blue sensitiveness of a plate is decreased by sensitizing. Thus the plates which were used for the keeping test had before bathing a speed of 55 with the C filter (blue), while after sensitizing with pinacyanol and water the speed dropped to 23, and after sensitizing with pinacyanol, water, alcohol, and ammonia to 26.

Dicyanine.

The makers' instructions for the use of dicyanine call for much the same procedure as in the case of pinacyanol. However, with dicyanine, even pre-washing failed to give satisfactory sensitizing with the water bath. Mees[11] states that it is necessary to bathe the plates immediately after adding the stock solution of dicysnine to the water, but even this procedure failed to give satisfactory results with the specimen of dye employed. This sample of dicyanine was about three years old.

When this sample of dicyanine was used with ammonia in the presence of enough alcohol to prevent flocculation, the sensitizing action was satisfactory. The use of ammonia has the important advantage of extending the sensitiveness to longer wave lengths, as well as increasing the action of the dye at its maxima. It is due to the use of ammonia that certain investigators[12] have been able to photograph in the infra-red as far as 1,000μ, while those who have not used ammonia with dicyanine have failed to photograph further than 800μ.

A satisfactory bath for dicyanine is as follows:—

Water	60 parts.
Ethyl alcohol (95 per cent.)	40 ,,
Dicyanine stock solution (1 to 1,000)	4 ,,
Ammonia (28 per cent.)	4 ,,

The more ammonia used the greater the sensitizing action, but the proportion of ammonia is limited by the fog it induces.

Dicyanine requires more care in its use than the other photo-sensitizing dyes. The solid dicyanine should be bronze green in colour. If it is not, particularly if it appears brownish, the dye has deteriorated and should not be used. The dye must be kept cool and dry in order to retain its sensitizing power. A freshly mixed bath of dicyanine is a bright blue-green colour. As soon as the dye deteriorates the colour changes considerably, the solution appears dull, and, in addition, shows a transmission band in the red. Such a solution should not be used. The temperature of the bath should not exceed 18° C. if plates reasonably free from fog are to be obtained. The alcohol rinse after bathing is decidedly beneficial.

11. Mees and Wratten, "Photographic Jour.," 58, p. 25, 1908 (Newton and Butl).
12. B. S. Bull., 14, p. 376, 1917.

Orthochromatic Sensitizers.

The other important sensitizers investigated were pinaverdol, pinachrome, homocol, orthochrome T, and erythrosine. These dyes are by no means as sensitive as pinacyanol and dicyanine to the action of electrolytes; they do not flocculate so readily in the presence of ammonia, potassium bromide, and alum. With the orthochromatic sensitizers the action of ammonia is most marked with erythrosine and homocol. The other dyes show a slight increase in sensitizing action with ammonia, but hardly enough to justify its use.

Erythrosine.

Erythrosine is stated by Eder[13] to be the best of the fluorescein dyes for sensitizing. Other important representatives of this class are eosine and rose bengal. He also states that plates bathed with erythrosine are superior to plates in which the dye is incorporated in the emulsion. We were not able, however, with the sample of erythrosines used (Kahlbaum) to produce plates which were as sensitive in the yellow-green as the orthochromatic plates made by one American manufacturer.

We found erythrosine to give the best results when used according to the directions given by Eder.[14] The plate is given a pre-bath for two minutes in

Water	100 parts.
Ammonia	2 ,,

Then it is bathed for two or three minutes in a bath of

Water	100 parts.
Stock solution (1 to 1,000)	20 ,,
Ammonia	2 ,,

The bathed plates should be washed in water to remove the excess dye from the gelatine. A rinse in alcohol will shorten the time required for drying.

An inspection of the spectrograms of commercial orthochromatic plates indicates that erythrosine or a dye of the erythrosine type is used in their manufacture. The advantage of erythrosine over such dyes as pinaverdol is its limited region of sensitizing action, since the sensitiveness conferred by erythrosine ceases abruptly at 580μ while the action of the other dyes continues rather farther into the red. This limited region of sensitiveness makes it possible to develop plates made sensitive with erythrosine in the light of an ordinarily good red dark-room lamp. This is a decided advantage to the practical photographer. One of the reasons that panchromatic plates have not been more generally used is that they must be developed in total, or at best in slightly modified darkness, so that the photographer is unable to judge whether or not he is carrying development to the contrast required by the subject and the printing medium to be used.

Pinaverdol, Pinachrome, Orthochrome T, and Homocol.

These dyes are very much alike in the regions for which they sensitize. Of these four dyes, homocol has its sensitizing action increased most by the use of ammonia. Their greatest application probably lies in their use in conjunction with pinacyanol to supply the slight deficiency of the latter in the green.

Hypersensitizing Commercial Panchromatic Plates.

The well-known action of a bath of dilute ammonia in increasing the speed of an ordinary dry plate was applied to commercial panchromatic plates in the process worked out by S. M. Burka[15] and C. C. Kiess at this Bureau in 1918. They found that commercial panchromatic plates bathed for four minutes in—

Water	75 parts.
Ethyl alcohol (95 per cent.)	25 ,,
Ammonia (20 per cent.)	3. 5 ,,

had the total speed increased 100 per cent. and the red speed increased 200 to 800 per cent. A greater increase in speed was obtained by the use of 3.5 to 100 cm. of water, with the omission of the alcohol. In this case, however, the plates dry more slowly and develop *more* fog than when alcohol is included in the hypersensitizing bath. A rinse in alcohol after the ammonia bath will help in drying the plates more rapidly. In an early investigation of the sensitizing properties of cyanine Schumann found that bathing in a dilute solution of ammonia imparted great speed and sensitivity to a plate with cyanine incorporated in the emulsion. (See "Photographische Rundschau, 3, pp. 143, 175; 1889.)

In fig. 7 are shown the results of a keeping test made on Wratten Panchromatic Process, D. C. The plates were hypersensitized without the use of alcohol. The plates gave evidence of a slight increase in speed for a few days after hypersensitizing,

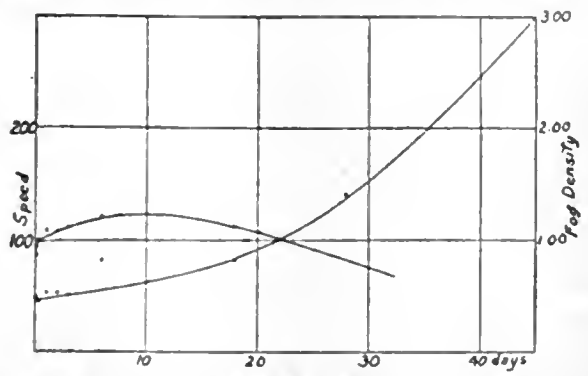


Fig. 7.—Variation of Speed and fog with time of keeping hypersensitized plates.

The fog has increased from a density of 0.45 to 3.00 in 45 days (a density of 3.00 transmits 1 1000 of the incident light).

Note.—The fog is given for $\gamma 2$; that is, the development was carried until the contrast was twice that in the subject.

while the fog kept increasing from the time the plates were hypersensitized.

A comparison of the increase in speed brought about by washing and by hypersensitizing commercial panchromatic plates shows that a part of the hypersensitizing action is due to the removal of certain soluble restraining substances by washing. In Table 2 are given the results of washing and hypersensitizing three typical panchromatic plates.

Increase in Speed by Washing before Exposure.

The improvement in sensitizing by washing the ordinary plate before bathing in pinacyanol-water solution suggested that there might be a corresponding improvement in the speed of commercial panchromatic plates. Accordingly a few typical panchromatic plates were washed for five minutes in running tap water and dried, following which the total speed to white light and the filter factors were measured. As seen from Table 2, all of the panchromatic plates showed decided improvement on being washed.

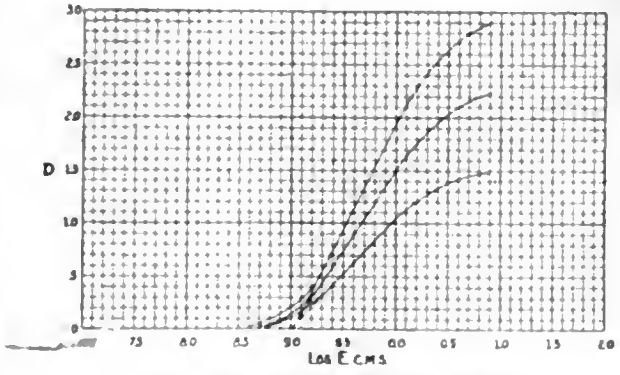


Fig. 8.—Spectrum process plate, untreated.

That the effect is not due to a change in the rate of development is clear from an inspection of figs. 8 and 9, which show the characteristic curves for the spectrum process plate before and after washing. Nor is the improvement due to the sensitizing action of some impurity contained in the tap water, since plates washed in a few changes of distilled water showed the effect as well if not better than with tap water. That the action is not due to a variation of the water content of the plate may be concluded from the fact that the plates before exposure in the sensitometer were backed and allowed to dry for about an hour. This time is sufficient for the unwashed plate taken from the box to come to the same state of humidity as the plate which had been washed.

This increase of sensitiveness may then be concluded to result

13. Eder, Handbuch 3, p. 174.
14. Eder, Handbuch, 3, p. 176.
15. Jour. Frank. Inst., 189, p. 25., 1920.

from the removal of certain restraining substances from the emulsion. From our experience with pinacyanol, chrome alum, and potassium bromide suggest themselves as the restraining substances.

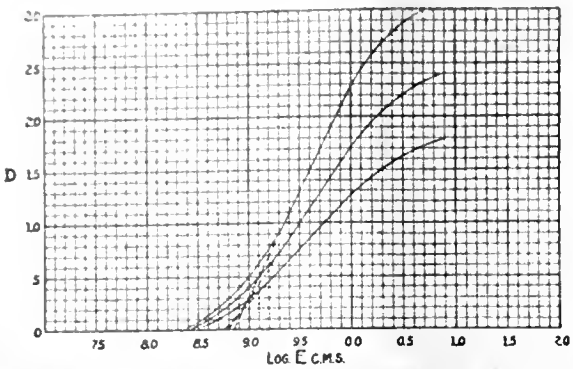


Fig. 9.—Spectrum process plate, washed in tap water for five minutes.

The comparison of the spectrograms of unwashed and washed panchromatic plates (fig. 10) shows that the greater part of the increase in speed to white light comes in the region of sensitiveness, which is due to the dyes. This is borne out by the speed measurements with the filters.

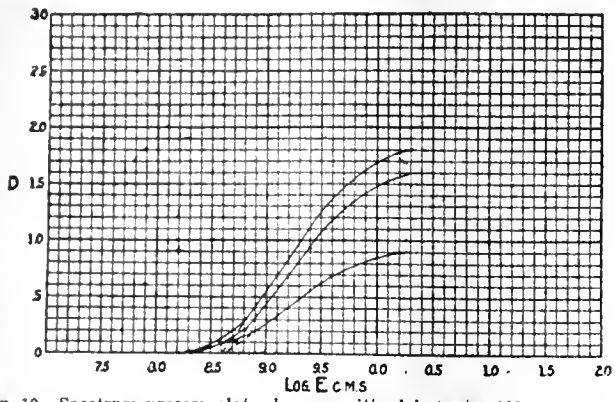


Fig. 10.—Spectrum process plate, hypersensitized in water 100 cc., ammonia (20 per cent.) 3.5 cc., and bathed four minutes.

TABLE II.

Plate.	Treatment.	Total speed.	Speed with filters.				Fog density for $\gamma=1$
			A	B	C	G	
Spectrum process *a*	None	96	5	8	8	16	0.40
	Washed ..	155	13	19	11	40	0.40
	Hypersensitized	235	22	34	16	75	1.30
Wratten panchromatic D.C.	None	180	16	15	17	36	0.20
	Washed ..	240	32	26	19	80	0.40
	Hypersensitised	380	59	50	44	140	0.50
Pan-ortho ..	None	91	9	7	8	16	0.30
	Washed ..	145	25	15	10	45	0.40
	Hypersensitized	275	49	32	19	106	1.30

a The spectrum process and the pan-ortho plates were over a year old, while the Wratten plate had just been received from the factory.

The table shows that while washing does not bring the increase in speed that hypersensitizing does it does not cause the production of as much fog. The characteristic curves (fig. 8, 9, 10) show that washing improves the scale or rendering power of the plate, while hypersensitizing does the reverse.

Manufacturers are urged to investigate the increase of sensitiveness found by washing in water, as it may be of considerable advantage to so treat their panchromatic plates before placing them on the market.

The Technique of Plate Bathing.

More or less difficulty will be experienced by anyone learning to bathe plates. It is advisable for the beginner to carry out the process in full light. This will enable him to follow the process and to discover the effect of the different baths on the plate; whether or not the bathing is sufficiently long for the dye to get through the emulsion, and whether or not the rinse removes the dye well enough from the gelatine. It will tell him how much he has to rock the trays containing the baths and will give him some idea of how long it takes the plate to dry after bathing.

An essential of successful sensitizing is absolute cleanliness. Dust or particles of old dye baths remaining in the trays will cause spots and streaks. Glass trays are to be preferred to enamelled trays because of the smoother surface and the less likelihood of contamination.

Foggy plates may be due to a number of causes—the choice of the wrong brand of plates for sensitizing, stray light during bathing and drying, the use of baths at too high a temperature, slow drying, or too much ammonia in the dye bath.

Slow drying sometimes gives rise to areas of varying sensitiveness on the plate, depending upon which part of the plate dries first. The rate of drying may be increased by the use of the alcohol rinse and by the use of a properly designed drying cabinet.

The drying cabinet shown in fig. 11 has several advantages. The air driven in at the top by an electric fan passes through efficient light traps, both at the top and the bottom. Two doors form the front of the box, and opening them gives access to all of the shelves, of which there are four, to hold drying racks filled with plates. The upright form of the cabinet gives it a very large capacity for the amount of floor space required. The long distance the air has to travel gives uniform distribution of the air current to all parts of the box in which plates may be placed.

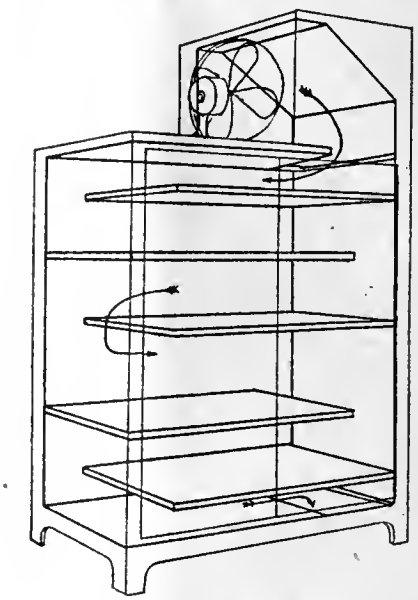


Fig. 11.—Drying cabinet.
The outside of the cabinet is shown in light line and the inside in heavy line.

Procedure and Formulas.

1. Stock solutions. —Stock solutions are usually made with pure ethyl alcohol (90 per cent. or stronger.) Some dyes are water soluble (erythrosine), while others dissolve in methyl alcohol. The usual strength is 1 g. of dye to 1,000 ccs. of alcohol (or in the same proportion). Some dyes are less soluble than this and require from 2,000 to 10,000 ccs. of alcohol to dissolve 1 g. of dye. It is advisable to put the dye in the solvent instead of pouring the solvent on the dye, as some of the dye may stick to the bottom of the bottle and require considerably more shaking to get into solution. If the dye does not dissolve in cold alcohol, the bottle containing the dye may be placed in a water bath and heated until the alcohol boils. If it does not go into solution after boiling 30 minutes, more alcohol should be tried.

2. Water solutions.—The bath is composed of

Water	100 parts.
Stock solution	2-6 ,,

Pinacyanol.—Wash the plate five minutes before bathing. Bathe two minutes. Rinse in alcohol until the film feels hard (three to five minutes).

Pinaverdol, Pinachrome, Orthochrome T.—Pre-wash optional. If pre-wash is omitted, bathe for four minutes.

Homocol.—Pre-wash optional, bathe four minutes if omitted. For increased sensitizing action, add 2 cc of ammonia.

3. Water, alcohol, and ammonia solutions. To be used when water dye bath flocculates on adding ammonia.

Water	65 parts.
Ethyl alcohol (95 per cent.)	35 ,,
Stock solution	2-4 ,,
Ammonia (twenty-eight)	2-4 ,,

In mixing this bath allow the alcohol and water to cool after mixing, add the stock solution, stir well, and then add the ammonia. Some baths work better if the minimum amount of ammonia is added before bathing the first plate, and more ammonia added as the bath loses its ammonia.

The plates are put directly in this bath, care being taken that the bath covers the entire plate. Bathe for four or five minutes and rinse in alcohol until the film is hard. Temperature should be 18° C. or less.

Pinacyanol.—As directed.

Dicyanine.—Requires full amount of ammonia.

Summary.

An investigation of the methods of sensitizing ordinary plates by bathing shows that certain precautions are necessary with some of the modern photosensitizing dyes and not with others.

Dicyanine gives a much greater sensitiveness and extends farther into the infra-red when used in a dilute alcoholic solution with ammonia than when used with water alone.

Pinacyanol gives good results in dilute alcoholic solution with ammonia, but plates bathed in water and stock solution are almost as sensitive and keep much better, provided the plates are thoroughly washed before sensitizing, as the soluble salts contained in the emulsion prevent the sensitizing action by flocculating the dye.

Washing has a favourable action on the colour sensitiveness of panchromatic plates and, while not so marked as the action of dilute ammonia, it gives no increase in fog, which always follows the use of ammonia.

The modern orthochromatic sensitizers, pinachrome, pinaverdol, homocol, and orthochrome T, are much less sensitive to electrolytes than are pinacyanol and dicyanine. Ammonia may be added to a staining bath of water and stock solution only, but does not increase the sensitizing action appreciably except in the case of homocol.

Films are best sensitized in a bath containing water, alcohol, ammonia, and stock solution.

Certain brands of orthochromatic plates were found to be superior to plates bathed with erythrosine (Kahlbaum's), but no panchromatic plate compared favourably with pinacyanol bathed plates, except one experimental emulsion furnished by an American manufacturer.

FRANCIS M. WALTERS, JUNR.
RAYMOND DAVIS.

TONING WITH TIN SALTS.

ABOUT a year ago, in the course of some chemical researches upon the organic compounds of tin involving the use of alkaline stannite solutions, it was observed that when these stannite solutions were warmed a change occurred causing the deposition of a grey precipitate. On examination, this precipitate was found to be metallic tin. The reaction which took place when a solution of sodium hydrogen stannite, for instance, was heated may be represented by the equation :—

$$2NaHSnO_2 = Na_2O_2 + Sn + H_2O.$$

Thus sodium stannate should be produced at the same time. On testing the alkaline filtrate after removing the metal this was found to be the case.

Since sodium hydrogen stannite, made by treating stannous chloride with excess of caustic soda solution, is also a strong reducing agent, it was at once thought that this deposition of a finely divided tin precipitate might be of service in various toning processes, and extensive investigations have been carried out both with the view of producing pleasant tones on bromide prints and with the object of elucidating the nature of the chemical reactions which take place in these processes.

The appearance of a fairly exhaustive article on "Colloid Silver Toning with Tin Salts," by Dr. F. Formstecher, in *Photographische Rundschau*, 1921, 58, page 277—an excellent account of which appeared in the *B.J.* for December 23, 1921, pp. 759-761—tempted the present writer to discontinue these investigations. But, as the subject is of considerable theoretical importance and adds something to the results obtained by Dr. Formstecher and also by Miss Woolley and Mr. Gamble, described in the *B.J.*, 1913, December 26, pp. 987-991, since quantitative experiments have been made, it is considered of sufficient importance and interest to place on record the results that have been obtained.

From the pictorial viewpoint pleasing tones can undoubtedly be produced by toning with stannous compounds, but there is some difficulty in obtaining uniform results, and ordinary sulphide toning is much simpler to carry out and gives uniform and certain results. Nevertheless, tin toning merits consideration.

For toning the bromide prints were first bleached with the ferricyanide solution recommended in the *B. J. Almanac* for 1922, p. 483. Other bleaching agents, *e.g.*, mercuric chloride and copper chloride solutions, did not give such good results unless considerably more care and trouble were taken.

In all cases the black deposit of silver is converted into an insoluble silver salt. Thus with the bleaching solution recommended the metallic image was converted into white silver ferrocyanide :—

$$4Ag + 4K_3FeC_6N_6 = Ag_4FeC_6N_6 + 3K_4FeC_6N_6$$

That this is the case was proved by exposing some precipitated silver chloride to the light and converting it into silver by ordinary development. The residue of silver was collected, washed free from all traces of developer, and then treated with potassium ferricyanide bleaching solution, which thereby became pale yellow, whilst the silver was changed to a white precipitate. The solution was filtered off and gave the usual reactions for potassium ferrocyanide, which were not given by the original ferricyanide solution.

In a typical quantitative experiment 0.1765 gram of exposed silver chloride gave 0.1094 gram of silver by development. Excess of potassium ferricyanide converted this into 0.1803 gram silver ferrocyanide. Treatment with sodium hydrogen stannite solution and subsequent washing and drying yielded 0.1130 gram of silver. These figures satisfactorily indicate that the reactions which take place follow the course outlined.

Further, when silver nitrate solution was treated with potassium ferrocyanide a white precipitate (of silver ferrocyanide) was produced, whereas when treated with potassium ferricyanide the silver nitrate gave a reddish brown precipitate (of silver ferricyanide).

To obtain the warm brown tones from the bleached prints these were then immersed in a bath of the alkaline stannite, when the image reappeared. The tin toning bath was made by dissolving 10 grams of sodium hydrate in 100 c.cs. of water. This solution was slowly added to the cloudy solution obtained by stirring 10 grams of stannous chloride crystals into 100 c.cs. of water, until the precipitate first formed re-dissolved; 100 c.cs. of water was then added. After standing, the clear solution was decanted off and contained approximately 2.5 per cent. of sodium hydrogen stannite, formed according to the equation :—

$$SnCl_2 + 3NaOH = NaHSnO_2 + 2NaCl + H_2O. + H_2O.$$

It has been shown elsewhere (*Chem. News*, 1922, 124, p. 215, April 21) that even when excess of alkali is used normal sodium stannite, Na_2SnO_2, is not produced.

For photographic purposes it was found advantageous to dilute this solution still further and use a 0.5 per cent. solution of the stannite, although at this dilution hydrolysis became apparent, since a white flocculent precipitate began to separate.

The chemical aspect of this toning process was investigated by treating the washed silver ferrocyanide, obtained as described above, with the alkaline stannite solution. This reduced it again to tin, sodium ferrocyanide and stannate being formed simultaneously according to the equation :—

$$Ag_4FeC_6N_6 + 2NaHSnO_2 + 6NaOH = 4Ag + Na_4FeC_6N_6 + 2Na_2SnO_3 + 4H_2O.$$

The dark insoluble residue produced in this reaction was filtered off and thoroughly washed to remove the sodium salts. It was quite insoluble in hydrochloric acid, but dissolved readily in

dilute nitric acid to a clear solution. Addition of hydrochloric acid to this solution gave a white precipitate (of silver chloride).

When this treatment was carried out quantitatively it was found that 0.1513 gram of the residue (silver), when dissolved in nitric acid and converted into the chloride with hydrochloric acid, gave 0.2009 gram of silver chloride. This corresponded closely with the calculated amount to be obtained from 0.1513 gram of pure silver.

It is thus established that this toning process with tin leaves an image of silver, whilst toning with sodium or ammonium sulphides converts the white silver salt (obtained by bleaching) into silver sulphide, *e.g.*:

$$Ag_4FeC_6N_6 + 2Na_2S = 2Ag_2S + Na_4FeC_6N_6.$$

Experimentally 0.1490 gram of silver ferrocyanide gave 0.1148 gram of silver sulphide on treatment with excess of a dilute solution of ammonium sulphide.

From the technical standpoint initial failures in this method of toning were largely due, strange as it may seem, to the thorough washing of the prints This entirely removed the sodium stannate and any meta-stannic acid, H_2SnO_3, which would result through the hydrolysis of sodium stannate on addition of water. Since colloidal silver absorbs the meta-stannic acid, producing a warm tone, it is advisable to simply remove excess of the alkaline tin solution by rinsing and allow the imperfectly washed print to dry.

The effect of subsequent immersion of the print in sulphide toning baths was tried, but did not appear to have any marked influence upon the final tone.

It is of interest to note that the alkaline stannite solution is able to reduce silver chloride to silver, which it does, whether this substances has been exposed to light or not. The reaction may be expressed :

$$2AgCl + NaHSnO_2 + 3NaOH = 2Ag + 2NaCl + Na_2SnO_3 + 2H_2O.$$

Lead is a metal which shows some chemical resemblances towards tin, and, since it is used in certain photographic processes, it was thought of interest to see if it could also be used for toning in alkaline solutions in the same manner as tin. Entirely negative results were obtained, however, using a solution of sodium hydrogen plumbite, $NaHPbO_2$, prepared from lead acetate solution and excess of sodium hydrate solution.

In his article Dr. Formstecher described various tin-toning baths and sometimes, carried out the process in two stages, using an alkali bath and one of stannous chloride. He also states that a bath of "tin salts" containing a little ammonia was suitable, and, unlike more acid solutions, has no eating-out effect on matt-albumen prints. The formula he ascribes to his "tin salts" is $Na_2SuCl_4H_2O$, but as the present writer has shown (*Chem. News*, 1918, 117, p. 193), sodium staunichloride has the formula Na_2SnCl_6 $6H_2O$.

Instead of using ordinary crystalline stannous chloride, $SnCl_2 2H_2O$, the more stable potassium or ammonium stannochloride was substituted for it in some experiments without any adverse effects being noticed. J. G. F. DRUCE, M.Sc., A.I.C.

FINDING CORRECT FOCAL LENGTH.

THE methods proposed for ascertaining focal length are quite numerous, but most of them call either for special apparatus or for the presence of a very distant object. In two of the best, a mark has to be made on the camera baseboard, which may be objected to.

One of the most convenient plans, requiring nothing but the camera and an ordinary foot-rule, is that originated by Mr. W. E. Debenham ("B. J.", September 19, 1879). In this, the rule is focussed sharply to a given definite scale or ratio, and the distance measured between rule and ground glass. This distance is then multiplied by the ratio, and the product divided by the ratio plus 1 squared. Or, to express it as a formula,

$$F = D \times \frac{R}{(R+1)_2}$$

For example, suppose an image of the foot-rule is focussed to exactly 3 in. long, or a ratio of 4, and the distance from rule to ground glass is found to be 53⅛ in. Then, $53\frac{1}{8} \times 4 = 212\frac{1}{2}$, and $212\frac{1}{2} \div 25$, or the square of $4 + 1$, $= 8\frac{1}{2}$ in. focus.

With careful focussing and measurement this method gives an absolutely correct result, provided the two nodes of the lens coincide, as in the case of the Cooke Series III., f/6.5, of 8½ in. focus. In the majority of lenses, however, the nodes do not coincide, so that the focus found by this formula will be a trifle too long or too short, according to whether the nodal space, or "NS," is plus or minus.

Now it is quite evident, by using a little thought, that the error will be equal to $\frac{R}{(R+1)^2} \times NS$. Suppose, for instance, a lens is of 6-in. focus and the ratio is 3, the correct distance between rule and ground glass being theoretically 32 in. If there is a plus nodal space of ½ in., the distance will really be 32½ in., and the focus, by Mr. Debenham's formula, will work out as $6\frac{3}{32}$ in., which agrees with the stated amount of error, for $\frac{3}{16} \times \frac{1}{2} = \frac{3}{32}$. Again, if the nodal space is minus ½ in., the distance would be 31½ in., and the focus will work out as $5\frac{29}{32}$ in., which is once more an error of $\frac{3}{32}$ in., only minus instead of plus. Obviously, to obtain the smallest amount of error the image should be as small and the distance as large as possible, though this certainly introduces more opportunity for a mistake in measuring. If the ratio is 9, the error will be only 9 per cent. of the nodal space, which is practically negligible.

The writer has found, however, that by somewhat modifying Mr. Debenham's very useful formula, it is quite a simple matter to eliminate the error, thereby obtaining the exact focal length. Suppose, for instance, in testing a lens by the foregoing method the ratio is 4 and the measured distance 62.7 in. Instead of proceeding to calculate, focus the rule sharply to another larger ratio, say 5, and again measure the distance, which turns out to be say, 72.2 in. The true focus can then be found by the following formula, in which D_1 and D_2 are the two distances, while R_1 and R_2 are the corresponding ratios :—

$$\frac{D_2 - D_1}{\left(R_2 + \frac{1}{R_2}\right) - \left(R_1 + \frac{1}{R_1}\right)}$$

Thus, in the example just given, the calculation would be :—

$$\frac{72.2 - 62.7}{5\frac{1}{5} - 4\frac{1}{4}} = \frac{9.5}{\frac{26}{5} - \frac{17}{4}} = \frac{\frac{95}{10}}{\frac{19}{20}} = 10 \text{ in., the correct focal length.}$$

Incidentally, we can now, if desired, ascertain the nodal space itself, by working out the focus from one of the distances with Mr. Debenham's formula, and noting the error. For instance, with a ratio of 4 the distance was 62.7 in., while 62.7 multiplied by 4 and divided by 25 equals 10.032 in. The error, therefore, is 0.032 in., and is plus. Now the nodal space will equal the error divided by :—

$$\frac{R}{(R+1)^2}, \text{ or } \frac{32}{1000} \div \frac{4}{25}, \text{ or } \frac{32}{1000} \times \frac{25}{4}, = +0.2 \text{ in.}$$

The foregoing formulæ are only offered as being of great assistance when the focus has to be known with absolute precision, as in copying, enlarging, or reducing to an exact scale, or deducing measurements from photographs. It will have been noted that Mr. Debenham's very ingenious and simple method has so small a percentage of error that it is quite sufficiently accurate for all ordinary purposes.

A. LOCKETT.

FORTHCOMING EXHIBITIONS.

August 26 to September 9.—Toronto Camera Club. Latest date for entries, July 22. Secretary, J. H. Mackay, Toronto Camera Club, 2, Gould Street, Toronto, Canada.

September 9 to October 7.—London Salon of Photography. Latest date for entries, August 30. Particulars from the Hon. Secretary, London Salon of Photography, 5a, Pall Mall East, London, S.W.1.

September 11 to 15.—Professional Photographers' Association, Princes Galleries, Piccadilly, London, W. (Trade and Professional). Hon. Secretary, Richard N. Speaight, 157, New Bond Street, London, W.1. Also foreign invitation loan exhibition of professional portraiture. Hon. Secretary, Marcus Adams, 43, Dover Street, London, W.1. Latest day for entries and exhibits, August 31.

September 18 to October 28.—Royal Photographic Society Annual Exhibition. Latest date for Entries, August 25 (carrier); August 26 (hand). Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

October 18 to 28.—Portsmouth Camera Club. Latest dates : Entry forms, October 11; exhibits, October 16. Particulars from the Hon. Secretary, C. C. Davies, 25, Stubbington Avenue, North End, Portsmouth.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

Self-Confidence and Enterprise.

"WHAT shall I do to get on?" is a question that every business man asks himself at some time or other, and the man who escapes the necessity of asking it at times like the present is fortunate. With some of us it is probably, "What shall I do to live?"

There was a time when all one had to do was to sit tight and wait for the work to roll in, and if things were not quite satisfactory, there were vacant positions to be had and branch studios to be opened. There are still vacancies, but they are snowed under with applicants, and though branches can still be opened, there is no certainty of their being patronised. The present general uncertainty of affairs is largely responsible for the poor state of the photographic business, and the uncertain weather has not helped to mend matters. Under these conditions it is a hopeless policy to expect work or business to come to us, or to meet us on the way. Both have to be caught and forcibly laid hold of. This is where the value of self-confidence and enterprise is apparent.

The applicant for a position to-day must do something more than write the orthodox letter "begging to apply for the post." That may stand one chance in a hundred; in a recent vacancy I know of forty-odd letters stood no chance at all, though coming from seemingly efficient people. To make sure of getting a post, or as sure as is humanly possible, one must apply expeditiously, determinedly, and personally. And the same thing applies to the owner of a business who wants business. He must find it, hold it, and keep it; and do it expeditiously, determinedly, and personally if he would be sure about it. Now, unless one has a heap of self-assurance, nothing will seem more distasteful or distressing than personally approaching people in a probably unsuccessful endeavour to extract money, either as work or trade. But the ordeal is not at all bad to the self-confident, enterprising party, who, being naturally optimistic, is not easily downcast or discouraged. His efforts are not *all* unsuccessful, and if he is sensible he does not expect them all to succeed; therefore he expects and gets a percentage of results. There is nothing very terrible about interviewing a stranger at one's own invitation. He or she may prove an ogre or ogress, but in any case some little interest will be experienced at least, and there is always the possibility of future results.

But, you may say, self-confidence and the spirit of enterprise are gifts. If one is not born with them, what then? In that case the former can always be simulated and the latter developed. In illustration of this I will relate a true case, the details of which I can vouch for. It is not an isolated example by any means; I could quote at least one almost absolute parallel. The photographer in the case was not born with any gift of self-assurance or assertiveness. Quite the reverse. He was of the type which enters a shop to sell wholesale, and buys something retail as an excuse for going in—and for getting out as quickly as possible. But this individual realised his deficiency, and knew that it had cost him many lost opportunities. So he forced himself to act as though he were just over from the States selling Cantaford cars at so much per gross. And by and by it became a habit, until to-day he cannot help it. It has become second nature to him. He revels in it. Enterprise cannot be called a gift; it is purely a matter of serious thought combined with the ability to act quickly and at the right time, and our friend kept this before him during the time I am going to speak about. It happened that he badly wanted a change, and for the first time in his career he experienced a difficulty in finding a new post that suited him. At last he decided to open up a new business, although his district was already overloaded with photographers and trade was at a low ebb. First he considered the various fields in which it was possible to practice photography, and, having decided which was the most likely to take root, he looked for possible customers. After interviewing (unannounced) some dozen strangers and receiving only five rebuffs, he thought the thing was good enough, and proceeded to the next move. This was to find financial assistance. Some, similarly situated, might have approached friends, or else professional financiers. Not so our friend. He marked down the hardest business man in the neighbourhood, and, being satisfied that this gentleman had both premises and means, he boldly suggested that they should open a new business in partnership. Although a total stranger, his suggestion was received with interest, and eventually the idea became a fact, and to-day the affair is going along well, in spite of adverse conditions in the locality.

The spirit of enterprise helped to follow up the self-confident start, by introducing and pushing new lines, seeking orders in unlikely places, and advising and assisting trade customers to improve their business. And self-confidence—or was it, rather, "cool cheek"?—still kept pace, as the following example proves. He heard that a certain party was about to be married, and the thought struck him that possibly there might be a good order for wedding groups. So he inquired the address of either of the parties, but no one knew where they lived. All that he could find out was that the young lady worked for Messrs. Dash, and Messrs. Dash were rivals of ours. That would have caused most of us to let the matter rest, but this photographer just stepped to the 'phone, rang up Messrs. Dash, and inquired for the address of Miss X., the young lady who had just left to get married, got it, went round to see her, and secured an order to appear on the wedding day and take the groups.

This, of course, might appear to be carrying self-confidence too far, and raking the ill-feelings of other photographers, but this is to some extent a matter of opinion, and many business people would say that it was merely a legitimate business move. In any case, it serves to show that trade can be obtained by deliberate intention.

There is a side to this question which I must not overlook. It is the capability or otherwise of a photographer to carry out the engagements and contracts which he may obtain by push and enterprise. In the instance just mentioned, the photographer's initiative would have done him more harm than good if, after getting the business, he had proceeded to make a mull of the work. Before going out after work, one must be confident, not only of getting it (or making a good bid for it), but also of being able to handle it to everyone's satisfaction when it is obtained. This brings us to the occasional case where there is a doubt. A good example of this occurred to me lately. I was asked to recommend a really good technical photographer to undertake some difficult work. Details of the work were not at hand, but I was given to understand that it was not easy to get the negatives or to please the party concerned. My first thought was to claim the business myself; my second was, Was it in my scope? I asked for the address, and called at the place where the work was. I found that while it was not beyond what I catered for, there certainly would be some doubt about getting the required results under the available conditions. I had not so far committed myself, and could have turned it down without loss of prestige, but decided that I might as well have it if it could be had without calamity, so I said that I could undertake it at such and such a price, and as there seemed some little uncertainty about satisfying the owner, I would make a sample negative and print at a nominal charge before proceeding further. The suggestion was received favourably, and I was informed that others had been given this work, and had started off with a number of exposures, the results of which were worthless, although charged for at full price. On showing up the sample, I discovered exactly what it was that was required, and also that I could do it, and I consider the trouble taken and the small risk of lost time, etc., were well repaid. Work that is normally outside one's usual business is sometimes worth tackling for more reasons than the profit on it. Such work successfully done means valuable experience, and may add substantially to one's reputation. Confidence and enterprise will obtain outside and new business for those who can do it. It only remains for me to add that, given these qualifications, one should not carry anything to the point of absurdity in undertaking an obvious impossibility, as that extreme would be just as bad as the other. A glaring example of what I mean would be the tackling of micrographic work on metals by a photographer who had no proper apparatus for the work, and did not know where it would be obtained or how it was used. And yet I believe that this class of photography is to be had by those who have the confidence to go after it. And though I don't pretend to know, I should think that it would be profitable work, too. A much simpler instance, and one which occurs, is the promising of a portrait or amateur

service in some particular style, in a time limit or at a price which is not reasonably possible. The confidence to go so far is misused, because the results end in a loss. But within the wide limits of practical possibility and reasonable profit, self-confidence and enterprise can be exercised to good purpose and with marked effect.

THERMIT.

Patent News.

Process patents applications and specifications—are treated in "Phota-Mechanical Notes."

Applications, July 3 to 8:—

PHOTOGRAPHY.—No. 18,356. Photography.—D. Newman.

APPARATUS.—No. 18,810. Photographic apparatus.—H. Diernhofer.

APPARATUS.—No. 18,373. Optical apparatus for reflecting photographic images.—C. van Soolen.

PROCESSES.—No. 18,311. Photographic processes—A. L. and M. Landan.

LENSES.—No. 18,341. Photographic lenses.—J. W. Hasselkus, G. Richmond and Ross, Ltd.

FLASHLIGHT.—No. 18,670. Apparatus for operating camera shutters and igniting powder, etc., from a distance.—R. E. Stephens.

CINEMATOGRAPHS.—No. 18,635. Cinematograph cameras.—E. B. Wedmore.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

AUTOMATIC AIRCRAFT CAMERAS.—No. 175,449. (November 29, 1920). As usual in mechanism of this type the air screw (not shown) drives a shaft 1 on which is mounted a worm 2 to drive a worm wheel 3 in one with a pinion 4 in gear with the gear wheel 5 meshing with the mutilated wheel 6, which wheel controls the operations of shifting the films and winding and setting the shutter between exposures and controlling the operations of releasing the shutter to make the exposures. This wheel 6 is held in the position in which its mutilation is adjacent to the wheel 5, and the mechanism disconnected, by a stop 51 coming into contact with the end of the spring con-

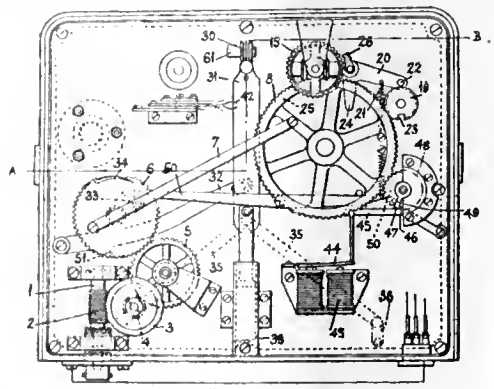


Fig. 1.

trolled lever 50 until the lever is moved clear of the stop by its opposite end being engaged by a member 49 carried by the blind shutter roller on the release of the shutter by an exterior time switch.

The mutilated gear wheel 6 is connected by means of the link 7 with the toothed wheel 8 (or alternatively a segment) which turns the receiving spool 18 and resets the blind shutter roller 48. A convenient form of gearing connecting the wheel 8 with the spindle of the receiving spool is shown by way of example in figs. 1, 6, 7 and 8. This wheel 8 is in engagement with the spur wheel 9 in one with a ratchet member 41 (fig. 6), which wheel 9 is free to run on the spindle 10 driving the receiving spool, and is also in one with the bevel wheel 11 in gear with the bevel gearing 12, 13, the wheel 13 being fastened by the pin 14 to the end of the driving spindle 10. The large gear wheel 15 carries the bevel wheels 12. It will be obvious from this arrangement that so long as the wheel 15 is free to rotate, the

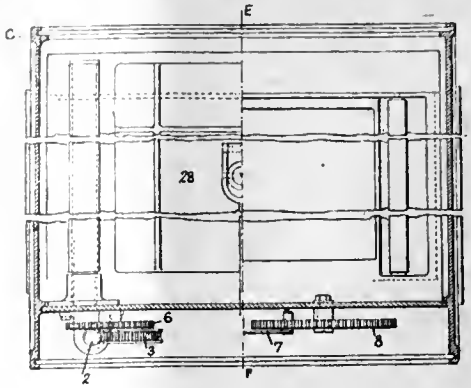


Fig. 2.

members of the bevel gearing will operate in opposite directions and the shaft 10 will remain stationary. When, however, a pawl 26 is brought into engagement with the wheel 15 to lock the wheel, the bevel 11 will transmit its motion direct to the bevel 13, and consequently to the shaft 10 carrying the receiving spool.

In order that a regular amount of film may be moved across the gate on each forward movement of the wheel 8 the film is passed from the gate over a measuring drum 17 (fig. 4) to the receiving spool 18. This measuring drum is in one with the notched disc 19 (fig. 1) co-acting with a lever 20 controlled by the spring 21 adapted to hold the member 22 in engagement with the periphery of the disc 19 during the rotation of the disc. The member 22 is adapted to enter the notch 23 in the periphery of

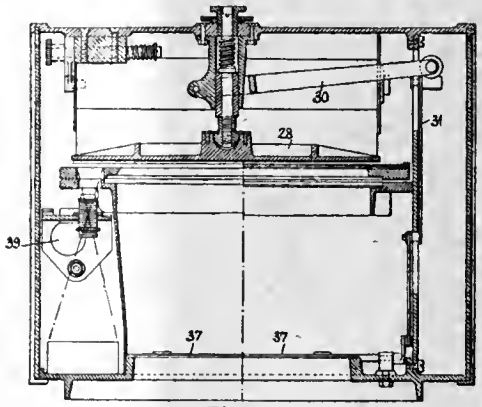


Fig. 3.

the disc 19 when the notch registers with the engaging member, and thus prevents any further movement of the measuring drum until the member is moved out of engagement with the disc. The spring controlled lever 20 is provided with an arm 24 adapted to be engaged by the pin 25 on the back of the wheel 8 and to lift the member 22 on its free end, out of engagement with the notch 23 against the influence of the spring 21 controlling the lever 20 and simultaneously to bring the pawl 26 into engagement with the wheel 15 co-acting with the bevel gearing through which the receiving pool is driven from the wheel 8.

From the above description it will be understood that when the measuring drum is free to rotate to measure a length of film drawn from the gate while the pawl 26 is in engagement with the wheel 15, and consequently the receiving spool is driven from the wheel 8 through the bevel gearing 11, 12, 13. When, however, the movement of the measuring drum is prevented, owing to the engaging member 22 at the end of the lever 20 dropping into the slot 23 in the disc 19, the pawl 26 is out of engagement with the spur wheel 15, and consequently the wheel is free to rotate, and the shaft 10 driving the receiving

spool 18 is stationary. The spring controlled balls 411 of the ratchet member 41 (figs. 6 and 8) co-act with an internally toothed ring (not shown) at the end of the spool 18 and prevent any backward movement of the said receiving spool.

The film in its passage from the supply spool 27 to the receiving spool 18 is adapted to pass under the pressure pad 28 (figs. 3 and 4), which pad is designed to hold the film against a glass plate 29 forming the film seat at the moment of exposure. This pressure pad is actuated through a lever arm 30 connected to the upper end of a vertical member 31 (figs. 1 and 3). This vertical member is attached to and actuated by a lever arm 32 adapted to be engaged by a roller member 33 projecting from the rear face of the mutilated wheel 6. During a portion

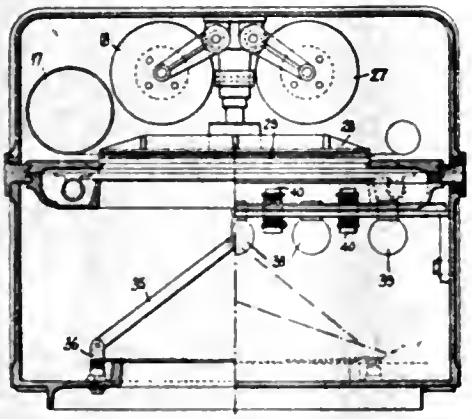


Fig. 4.

of the revolution of the wheel 6 the lever 32 is pressed down and with it the vertical member 31 and the pressure pad 28 connected with the upper end of the member 31 through the arm 30, while during the upward movement of the roller 33 the lever 32 follows the roller and carries the mutilation 34 on the periphery of the wheel 5 past the driving wheel 5 when the stop 51 is released by the lever 50, and thus brings the wheel 6 into mesh with the wheel 5. The lower end of the vertical member 31 is connected by links 35 (figs. 1 and 4) with the cranks 36 on the spindles carrying the capping flaps 37 (fig. 5), so positioned that when the vertical member 31 is pressed down to bring the pressure pad 28 against the film in the gate the capping flaps

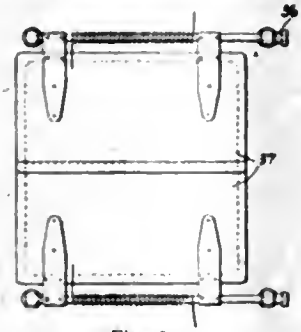


Fig. 5.

are raised to allow of an exposure being made. The upward or return movement of the vertical member 31 under the influence of the capping flaps 37 is retarded by a dash pot 38 at the lower end of the member. As above described, the upward movement of the arm is adapted to turn the mutilated gear wheel 6 at the desired moment until its mutilation 34 has passed the point of contact with the periphery of the driving wheel 5, and the driving wheel is again in engagement with the teeth on the unmutilated part of the periphery of the wheel 6, thus bringing the mutilated wheel 6 into gear again for a fresh cycle of operations.

In aircraft cameras means have been provided for photographing the faces of clocks and other recording instruments at the moment when the exposure is made. Hitherto it has been usual to arrange these instruments outside the camera casing.

According to the invention a series of instruments are arranged within the casing and their faces are lit up by electric lamps 39 (fig 4), thus providing for a series of photographs of these instruments to be taken along the edge of the film through a corresponding series of small lenses 40 mounted within the casing. The lamps are lit up during the exposure and no other shutter means are necessary for the lenses registering with the faces of the instruments.

The member 31 is provided with an ebonite striker 61 adapted to engage the electric contacts 42 (fig. 1) to light the electric

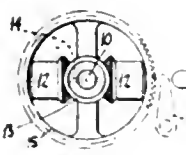


Fig. 7.

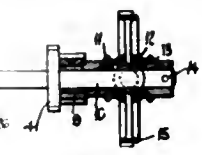


Fig. 6.

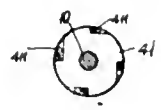


Fig. 8.

lamps 39 at the moment when the film is held in the gate by the plunger 28 and the capping flaps 37 are raised for the exposure of the film.

The release of the shutter is controlled by an exterior time-switch which may be placed in any convenient position for the pilot or observer to operate. The operator sets the time-switch to release the blind shutter to make exposures at pre-determined intervals of time. The control mechanism is shown by way of example in fig. 1. The release of the switch is adapted to energise the solenoids 43, thus actuating the contact 44 and moving the lever arm 45 to a position in which its shoulder 46 is clear of the dog 47 and releasing the blind shutter roller 48. The rotation of the roller 48 brings a projecting pin 49 into contact with the end of the spring controlled lever 50, thereby raising the other end of the lever to a position in which it is clear of the stop 51 on the back of the mutilated gear wheel 6 and allowing the gear wheel to be turned to a position in which the mutilation 34 on the periphery of the wheel has passed the point of contact with the driving wheel 5, thus allowing of a fresh cycle of operations actuated by the air-screw to bring a new length of film into the gate and to rewind and set the shutter.—Colin Martin Williamson, Litchfield Gardens, Hawthorn Road, Willesden Green, London, N.W.10, and Frederick Charles Victor Laws, Air Ministry, Alexandra House, Kingsway, London.

The following complete specifications are open to public inspection before acceptance:

Colour Photography.—No. 182,476. Process for the production of transparencies for the projection of photographs in natural colours.—H. Diernhofer.

New Books.

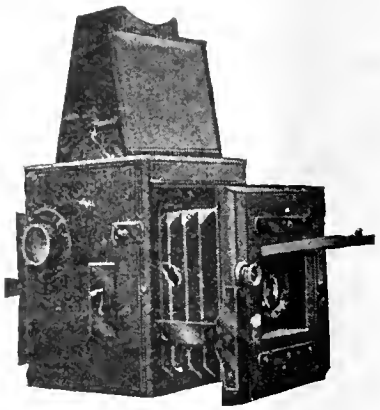
The A.B.C. of Wireless.—However little knowledge one may have of the higher technics of electricity, it is impossible to restrain a curiosity regarding the ways and means of the triumphs which have been accomplished in the field of wireless telegraphy, particularly so when inventors crop up every now and again with promises of the wireless telegraphy of photographs. This little manual is written for the purpose of giving an answer in non-technical language to the question, "How is it done?" The author, Mr. Percy W. Harris, editor of "Conquest," writes interestingly and very simply of the evolution and modern achievements of wireless, and contrives to give to the most non-technical reader a reasonably comprehensible account of the electrical methods by which telegraphy and telephony through space have reached their present degree of efficiency. The little book contains a final chapter of advice on the purchase of a wireless set by those wishing to occupy their leisure time by "listening-in." The book is published by the Wireless Press, Ltd. 12-13, Henrietta Street, London, W.C.2, price 6d. net.

Photographic Companies.—The particulars of company registrations at Somerset House for the first six months of the present year, which are issued by Messrs. Jordan, 116, Chancery Lane, London, W.C.2, include one public company relating to photography with a capital of £25,000, and twenty-one other companies of an aggregate capital of £244,662.

New Apparatus.

The Zodel Reflex Camera. Sold by Wallace Heaton, Ltd., 119, New Bond Street, London, W.1.

A QUARTER-PLATE British made reflex camera, complete with f/4.5 anastigmat, for less than £17 is a sign of the recovery to pre-war values which is being made in photographic apparatus. In offering the Zodel camera at this price Messrs Wallace Heaton are pursuing the policy adopted in their supply of both new and second-hand appliances, namely, that of offering reliable goods at such a narrow margin of profit that the retail purchaser is enabled to buy at prices not much in excess of those to which he was accustomed before the war. The Zodel reflex, which we have had an opportunity of trying is a thoroughly well made instrument, in which the features which are of importance in reflex work have received full consideration. In the first place it is rapid in action. The shutter is set by a single turn of the large winding key, which serves also for adjusting the speed of exposure for any time on the scale marked from 1-1,000th to 1-10th of a second. This is the



only movement required in preparing for a further exposure, since the mirror is of the type which automatically falls after the exposure. The arrangement of the shutter allows of the time of exposure being lengthened, though not shortened, without releasing the shutter and setting it afresh. A very good feature is the hinging of the frame which carries the hood, thereby rendering the focussing screen instantly accessible for cleaning from dust, which, as every user of a reflex knows, interferes with accurate focussing. In the quarter-plate size the extension is just over 9 inches, and the rise of front three-quarters of an inch. The camera is built square and is fitted with substantially made rotating back for horizontal or upright pictures. The lens is completely sunk in the front board of the camera, and, when not in use, is covered by a hinged flap which, when raised, forms a useful sky shade. As supplied, the Zodel is fitted with double solid pattern dark slides of the kind in which the two are inserted back to back at one end of the holder, which is closed by a cross piece secured by a pair of brass clips.

The price also includes a detachable back focussing screen and hood for use when the camera is used on a tripod or in any position when it is inconvenient to observe the image through the customary upright hood. The Zodel is made in two sizes, namely, 3½ x 2½ and quarter-plate. Without lens and with one double dark-slide the respective prices are £13 15s. and £14. The instrument may be supplied with lens by any leading maker, and its design and mechanical quality are deserving of a first-rate optical instrument.

THE ECONOMY EXPOSURE CALCULATOR.—The substitution of calculation for trial-and-error methods in ascertaining the exposure for development papers in enlarging and contact printing is an aim which has our hearty approval. It is the aim of the present "calculator," which consists of a booklet of instructions, a pair of logarithmic scales, and a sheet of tracing paper, the latter for use in the method of measuring the density of a negative which forms part of the system. Nevertheless, we cannot think there is much to be said in favour of the system which is advocated. For one thing, it involves more preliminary work than, we are persuaded, the professional or amateur printer will undertake. For another, the method adopted for "measuring" the densities of negatives is not one in which confidence can be reposed. No sensitometric system of exposure calculation in printing or enlarging can be simple in use, but the basis should at least be accurate, and in that respect the present system is open to serious objection.

Briefly, the system consists (1) in obtaining a figure for the density of a negative by a method to which we will refer directly. Then (2) the exposures respectively required by what is termed a "standard" negative on various makes of paper with the customary intensity and distance of the printing light are ascertained by trial. Finally (3) with negatives of different density the exposures under the same conditions of paper and illumination will be in the ratio of the negative "densities," a logarithmic disc calculator being provided for facilitating this computation. This last item in the system might be allowed to pass if the "density" figures represented the relative opacities of the negatives, but, if we describe the method adopted for the "measurement" of the so-called "density factor," it will be seen that the latter is not a measure of the light-stopping properties of a negative.

The negative is placed in a printing frame and backed by a piece of tracing paper, and the two kept in place by inserting a sheet of clear glass and one half of the hinged back. The frame, thus displaying half of the negative, is placed upright on a bench and a light-source, such as a candle, placed 2 ft. from it facing the front of the frame, i.e., the negative. In line on the other (rear) side of the frame a light-source of equal intensity is moved to and fro until the details of the negative just disappear from the tracing paper, which faces light No. 2. Such a method, however, is not a single measure of the highest density in the negative. It is not, as an amateur contemporary erroneously states, the grease-spot method. The contrast of the negative, and in particular the juxtaposition of greatly different patches of density largely enter into the measurement; for which reason the resulting "density factors" are not comparable except in the case of negatives of normal contrast containing light and dark patches close together. Thus, in our opinion, exposures calculated on this basis will frequently be entirely misleading, according as the negatives differ in contrast quality from the "standard." The booklet describing the system is supplied by J. Darby, South Street, Barming, Kent, price 2s. 6d. post free, inclusive of the disc calculator and the sheet of tracing paper.

Meetings of Societies.

MEETINGS OF SOCIETIES.

SUNDAY, JULY 23.

Hammersmith Hampshire House Phot. Soc. Outing to Wisley.

MONDAY, JULY 24.

Southampton C.C. Questions and Answers.

TUESDAY, JULY 25.

Hackney Phot. Soc. Holiday Photography. J. J. Beasley.
Bournemouth C.C. The Oil Process. F. G. Burroughes.

WEDNESDAY, JULY 26.

Rochdale Amateur Phot. Soc. After-Treatment of the Negative. H. Dawson.
Exeter Camera Club. Outing to Poltimore Pork.

SATURDAY, JULY 29.

Sheffield P.S. Outing to Lincoln.
Bradford Phot. Soc. Outing to Skipton Castle.
Edinburgh Phot. Soc. Outing to Penicuik House
Bournemouth C.C Outing to Netley Abbey

CROYDON CAMERA CLUB.

Affairs resumed a photographic aspect last week when the cheerful, confident, and combative Mr. Vivian Jobling briefly demonstrated a "Magic Mask." By means of straight cuts in combination, it is believed, with a novel method of folding the paper, rectangular masks of any required size can be produced with ease, and with no fear of cross-cutting the corners. Even if the folding part of the business should happen to be a bit out, final correction is easy with two strokes of the knife. The ingenious stunt is well worth publication, but is impossible to describe without diagrams. It would add an attractive turn to the repertoire of any paper-manipulating street artist.

A discussion followed on the new Barnet matt emulsion plate, and its halation-resisting qualities. It was generally agreed that the opacity of the film would eliminate halation, or reduce it to negligible proportions, but some surmised this would be at the expense of irradiation, or spread of light from particle to particle. Mr. Purkis was of opinion that although irradiation was bound to occur in such a turbid medium, yet it would be confined within such narrow limits as not to interfere materially with sharpness of outline.

The president, Mr. John Keane, said that the ready way in which the film took pencil, should render the plate of great service to the pictorialist. When enlarging from the matt emulsion plates, with a sheet of ground glass placed behind the condenser, he had met with granularity in the print, despite assurances to the contrary. Mr. Salt pointed out that a sheet of glass ground on both sides gave the maximum diffusion or scatter, with the minimum obstruction of light. It was superior in this respect to two sheets of glass similarly ground, but on one side only, with or without an intervening air space.

The evening concluded with a consideration of a proposition by Mr. Catharine that in future the proceedings of the club should be opened with prayer. He is now resident in Tonbridge, and it appears its Town Council have adopted the plan, despite strong opposition from a member, who pointed out that Parliament had long since followed a similar course without appreciable benefit.

As a start, Mr. Catharine suggested that the president should read a sort of non-sectarian Collect. A paragraph from Communication No. 144 from the research laboratory of the Eastman Kodak Co. relating to Einstein's hypothesis of 1905, which recently appeared in the "B.J.," he regarded as being suitable. The reading of this paragraph put the lid on the proposition, which was unanimously rejected.

News and Notes.

HAMMERSMITH PHOTOGRAPHIC SOCIETY.—Owing to a fire at Hampshire House, weekly meetings have been suspended until further notice.

RESTRICTING POLICE-COURT PHOTOGRAPHY.—Judges and magistrates are slowly but surely putting a ban on photography in police courts. Notices in Bow Street and other police courts concerning the use of a camera are being placed in more prominent positions, and the police officers are becoming more alert. Mr. Justice Shearman stated at the Staffordshire Assizes last week that he noticed with concern that one of the newspapers published a photograph of an accused man who was in the dock the day before. To his mind it was neither decent nor proper that a court of justice should be turned into a theatre, and as far as it was within his power he intended to take measures to stop photographs being published during the trial.

PORTSMOUTH CAMERA CLUB.—The twenty-eighth annual exhibition will be held from October 18 to 28. There are four open classes, one for portraiture and figure studies, another for other subjects, and two others for lantern-slides (monochrome) and colour transparencies. Awards and certificates will be offered in each class. For convenience of hanging, standard size mounts are requested, of vertical measurement, 25, 20, 16 or 12 inches. In the open classes an entry fee of 1s. per print is charged, and the same amount for each four slides or colour transparencies. The latest date for entry forms is October 11; for exhibits, October 16. Prospectus and entry form from the hon. secretary, Mr. C. C. Davies, 25, Stubbington Avenue, North End, Portsmouth.

FINGER-PRINT PHOTOGRAPHS BY WIRELESS.— M. Bélin is stated to have already invented an instrument whereby photographs not only of persons, but of finger-prints can be sent by telephone. He now declares (says the "Star") that, by means of his instruments, he can send equally good photographs by wireless. There is, as a matter of fact, a system, known as the Collins Code, by which descriptions of finger-prints can be telegraphed. By this system the finger-print is sent by telegraphing numerals, and these, when "translated" by the receiver, give the lines. The trouble is that, at best, this is but a description of the finger-print, and that if one figure in the wire is wrong, the value of the whole print may be destroyed. M. Bélin's prints, on the other hand, are actual photographs.

ALL-BRITISH £3,000 COMPETITION.—A most enjoyable luncheon gathering was held on Tuesday last, at which members of the photographic trade and Press had an opportunity of seeing something of the large entry of prints received in Part I. of this competition, which closed on June 30 last. Two of the judges, Sir William Orpen and Mr. Gordon Selfridge, were prevented from being present, but Miss Neilson Terry, Mr. Wastell, and Mr. George Robey were there. Mr. Edgar Houghton, who presided, said a few words by way of emphasis of the success which had attended the competition, and declared that his arm ached from the labour of signing the many cheques which were shortly to be forwarded to successful competitors. The full list of the awards to camera users and dealers will be published within the next few days.

PHOTOGRAPHY IN TIBET.—The British Buddhist Mission to Tibet left London last Friday for Lhassa, a photographer, Mr. W. Harcourt, being one of the party. It was stated at a farewell dinner that the mission would begin their long march to the great roof of Asia from Darjeeling. They would climb from Gongtok to a plateau 14,000 feet high and then tramp to the Brahmaputra River, down which they would float for 160 miles on a raft to Chaksam. There the final stage of the journey to Lhassa would begin. The journey down the Brahmaputra River to a point 30 miles from Lhassa would be the first ever undertaken by Europeans. Photographic and film records will be secured of the country, of the customs, folk-dances, occupations, and everyday life of the people, as well as of the religious ceremonies and processions, which are at present enshrouded in mystery.

A LARGE BARGAIN LIST.—Messrs. Robbins, Manistre (The London Camera Exhange), of 2, Poultry, Cheapside, London, E.C.2, have just issued an exceedingly well-arranged list of their stock of second-hand cameras, lenses, etc., amounting to very nearly 1,000 separate items and sets. Every individual piece of apparatus is identified by the firm's stock number, and the list has been published only after very careful comparison between the printed particulars and the actual specification of the goods. Both the professional and amateur photographer will find in these pages particulars of cameras, lenses, enlargers, of all types from the largest to the smallest, and may accept with confidence the firm's assurance that prices have been liberally marked down to the current market level. Moreover, Messrs. Robbins, Manistre, recognising that professional photographers obtain a trade discount in purchasing their business supplies, extend this benefit also to the second-hand apparatus which they supply. The prices named in the present list are thus subject to 10 per cent. discount in the case of purchases by bona-fide professional photographers. The list, which is certainly one which should be obtained, is obtainable post free on application.

Correspondence.

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

*** *No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspnodents.*

COARSE-GRAINED NEGATIVES.

To the Editors.

Gentlemen,—On page 424 of the "B.J.," dated July 14, in reply to a correspondent the coarse grain of rapid plates is referred to, and (presumably) the querist is advised to use isochromatic plates—with full exposure and a weak developer—if a very fine grain is required, or, of course, very slow ordinary plates. The latter have been recommended and used for generations in cases where the finest of grain is wanted, but the recommendation of iso plates for fine grain is new to me; in fact, experiments made some years ago proved, without the slightest shadow of doubt, that, all other things being equal, iso plates gave a more pronounced grain than ordinary plates.

Old hands will perhaps remember that in December, 1891, when a certain well known firm introduced the first popular iso plate, the grain was so coarse that it threatened to be a failure commercially. Happily, however, improvements were quickly made, and the plate became a big success, but the grain was never so fine as an ordinary (non-iso) plate of the same speed. All iso plates have improved

since those early days, but some further experiments carried out in later years—but before the days of the self-screen plate—showed that iso plates were still more grainy than the ordinary brand, and the experiments I made were repeated—and my opinion confirmed—by the late Mr. J. I. Pigg, who made the most careful microscopical examinations of the developed image.

A plate, no matter what make, is not always to blame in cases of pronounced grain, for the developer and the method of drying each play their part in governing the amount of grain—the method of drying perhaps being the most important.

A pronounced grain is more common in summer than in winter, the temperature of the atmosphere during drying affecting the grain to a far greater extent than the average worker imagines. The more quickly a negative is dried, and the warmer the air in which drying takes place, the coarser will be the grain. This may be proved very easily by cutting a plate in halves, drying one half as quickly as possible in a warm place, the other half in a cooler place, and examining under a microscope. Indeed, with some plates a microscope will not be necessary, the difference in grain being visible to the naked eye. As heat increases grain, it will be obvious that a warm developer will do its work in producing it, and when the finest of grain is wanted, it is not advisable to have the temperature of the developer above 65 deg. Fah.

There are, I believe, several theories concerning grain, old authorities differing on the matter. It is, therefore, one that might claim the special attention of present-day photographic investigators.—Yours faithfully,

GAMMA X.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

L. J. BOON.—We think the lens you require is the Dallmeyer f/2.9 "Pentac" anastigmat portrait, which is made in focal lengths up to 12 inches. The latter is listed for a 7 x 5 plate, the 10-inch for a half-plate.

J. H.—We have found nothing better than thin nainsook for diffusing the light of half-watt lamps. It is more durable than tracing cloth, and can be washed when dirty. The General Electric Co., Magnet House, Kingsway, London, W.C.2, give special attention to lamps for photographic work. Six 1,000 c.p. lamps make a very good installation. By having so many lamps you get better diffusion than with fewer of the same total candle-power.

B. W.—We do not think that acetylene burners are at all suitable with the vertical enlarger. We think you would lose a good deal of light by burning flames in a horizontal position which are intended to burn vertically. If you cannot get electric light we think it would be better to use a set of inverted "Howellite" incandescent gas burners, or one good burner of this type in conjunction with a condenser. The "Howellite" burners are supplied by Messrs. J. J. Griffin & Sons, Ltd., Kemble Street, Kingsway, London, W.C.2.

M. T.—The addition of potash metabisulphite to the fixing bath keeps the latter from becoming discoloured, and in that respect is certainly an advantage in handling bromide prints. In fact, the bath will keep almost free from colour as long as it retains its fixing powers. Therein, on the other hand, lies the danger of using it after it has reached a state of exhaustion when it is incapable of fixing prints quickly. For this reason many photographers prefer to use a plain hypo bath, which becomes coloured as prints are fixed in it, so that the discoloration of the bath is a certain rough indication of its progress towards exhaustion. If you do not stint the fixing solution, but use plenty of it in the routine fixation of prints, unquestionably it is better to add the metabisulphite.

H. S.—If you carry on a separate business under a name which is not your own, under the Business Names Act you are required to register that business, even though financially it is one with your chief establishment. The object of the Business Names Act is to disclose to the public the proprietors of businesses with which they deal, and, therefore, we expect that the case of a subsidiary business is provided for. The form for registration is obtainable from the Registrar of Business Names, 3-4, Clement's Inn, London, W.C.2. Under the Act you are required to put your real name on all essential business literature, such as invoices, etc., but it is not necessary to put the real name on mounts, nor to display it on the outside of the premises.

A. C.—About the only method for toning a bromide print yellow is to bleach in the lead intensifier and then to immerse the print in a bath of potass bichromate. This gives a yellow image, but much paler and less full in colour than the specimen you send. Formula for the bleaching solution is:—

A.	Lead acetate	1 oz.
	Acetic acid	1½ drs.
	Water	20 ozs.
B.	Potass ferricyanide	1 oz.
	Water	20 ozs.

A and B are mixed together to form the bleaching solution. The bleached print is washed for half an hour or more in running water and is then placed in a 5 per cent. solution of potass bichromate. It is advisable to pass prints through a weak bath (about 2 to 3 per cent.) of nitric acid after bleaching and before treating with the bichromate.

B. C.—Thomas's formula for purple tones in their lantern-plates was:—

	No. 1.	
Pyrogallic acid	1 oz.	30 gms.
Metabisulphite of soda ...	1 oz.	30 gms.
Water to	80 oz.	2,400 c.c.s.
	No. 2.	
Ammonium bromide	8 oz.	240 gms.
Liq. ammonia (.880)	4 oz.	120 c.c.s.
Water to	80 oz.	2,400 c.c.s.

Use equal parts of each solution. This developer allows great latitude in exposure, and takes from 3 to 12 minutes to develop, according to the amount of exposure given. When using this developer the image will appear buried and lacking in density if examined by ruby light, but, when fixed, will be fully dense, and the deposit will appear opaque by reflected light and purple by transmitted light, improving in colour when dry.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3247. Vol. LXIX. FRIDAY. JULY 28, 1922. Price Fourpence.

Contents.

SUMMARY.

In a communication from the British Photographic Research Association Mr. F. C. Toy criticises the experiments on which is based the view that the phenomena of the action of light on the ultimate grains of an emulsion afford support for the modern quantum theory of light. (P. 443.)

In an article on the focal-plane shutter, published in "American Photography," Mr. Charles T. Jacobs gives some useful advice on obtaining the best results from this type of shutter by employing high-tension in place of narrow slit when the shortest exposures are required and when a large aperture of lens is being used. (P. 445.)

In the current issue of the "Journal of the Society of Chemical Industry" clean scrap iron is recommended for recovery of the silver from spent fixing baths, etc. The writer, Mr. E. Gardner, gives directions for making the filter-cloths for collection of silver residues. (P. 447.)

At the last meeting of the Council of the Professional Photographers' Association reports were made of the favourable arrangements in progress for the forthcoming Congress. Mr. W. E. Gray was able to announce that a satisfactory decision had been obtained from the railway companies regarding the conveyance of apparatus as photographers' luggage. (P. 451.)

A suggestion which would perhaps do something towards mitigating the evil of the free sitting system is made in a paragraph on page 441.

Mr. Arthur C. Banfield records his satisfaction in the long use of a 12 x 10 soft-focus lens for which only a few shillings was paid. (P. 455.)

Opportunities of discreet advertising, which occur in the social life of a town and in which a photographer can share, may often be profitably taken. (P. 442.)

A hint regarding the arrangement of groups, which have to be taken with a wide angle lens, is given in a paragraph on page 442.

In a leading article we give some advice on the choice of a camera which can be used effectively in the hand and at the same time serves the majority of the purposes for which a stand camera is used. (P. 442.)

In the storage of negatives in their original boxes the top negative of each box should be placed face down. Negatives in bags should be inserted with the film side facing the front of the bag: if placed facing the pasted seam markings are liable to appear in the course of time. (P. 454.)

A form of flash lamp, which includes provision for the collection of the smoke and adopts a wireless method of igniting the powder, is described in a recent patent specification. (P. 448.)

A correspondent draws attention to the damage recently done to moist negatives by insects. (P. 453.)

At the Croydon Camera Club last week the hon. secretary, Mr. J. M. Sellors, gave many useful hints on the art of lettering, and recommended inks and pens which in his long practice he had found satisfactory. (P. 450.)

EX CATHEDRA.

A South Light. In a recent examination, the following question was put: "How would you overcome the difficulty of lighting the sitter in a studio with a southern aspect?" Quite a number of students solved the problem by recommending that all light be blocked out and half-watt lamps installed. This is certainly an effective method, but during a great part of the year rather a wasteful one, not to speak of the healthful properties of daylight. The reply which it was intended to elicit was that every effort should be made to screen out all light not needed for producing the negative. This can best be effected by means of fairly large screens; ordinary backgrounds upon their stands answer very well, placed parallel with the side light, at such a distance as will not interfere with the lighting of the sitter, but will prevent a general glare and excess of reflection from the walls. It is advisable in such a studio to have very thin white curtains to cover all the glass during the period of sunshine. At other times they can be drawn out of the way, making this system superior to that of using ground glass or a stippling of paint.

* * *

Free-Sitting Reforming Itself. We are very glad to have heard expressions of approval by leading West-end portrait photographers of the paragraph in which we recently ridiculed the clumsy methods of some of those who are playing the free-sitting game. (B.J., June 23.) The thing which interests us particularly is that this approval comes from people who themselves offer a pretty fair number of free sittings. But they like to see the system worked intelligently, and, moreover, so we hear, they take the view that the time has come to do something in the way of setting certain limits to the practice of approaching people, offering to photograph them for nothing. They take the view—and we entirely agree with them, for it is a point which we have emphasised over and over again—that the broadcast canvassing of people belonging to certain classes of society is a stupid scheme, and one which is damaging to photographic portraiture as a whole, unless there exists a real and unquestionable demand by the illustrated Press for photographs of the people. In a very great number of cases no such demand exists; the canvassing photographer says that it does, simply by way of excusing his importunity. His actual motive is to wheedle an order out of the sitter after the sitting has been given. We are quite prepared to draw a distinction between the offer of a free sitting, which is prompted by a known demand on the part of the Press, and that which is only an underground dodge to obtain orders for portraits. Perhaps, by the exercise of a little casuistry, one may be called legitimate and the other illegitimate. At any rate, some progress would be made towards eliminating this objectionable feature from the

business of photographic portraiture, if some agreement could be come to for the discontinuance of the broadcast system by confining the invitations to people whose portraits may reasonably be regarded as in current demand by the newspapers. We realise that it is not easy to draw a line, but the distinction which we have made may, perhaps, supply a basis for discussion

* * *

Advertising. The photographer with a good-class business is often apt to look upon advertising as *infra dig.* There are, however, more ways of advertising than by paying for an insertion in the newspaper, and subtler methods are sometimes more effective in the long run and with certain classes of customers. It is often a paying proposition for a photographer to take an active part in the social life of his town. A subscription to the local musical or dramatic society is often worth while; still better is an active participation in their proceedings. Membership of the local literary, debating or archæological society, apart from the actual business it might bring in, is useful in keeping one's name before the public. Of course, one should take a little *real* interest in these subjects, and not go to a society meeting unequipped with the elements of knowledge of the subject under discussion; cultivated people, like a cobbler who does not stick *too* closely to his last (to use a homely metaphor). Attendance at book and fine-art sales, race meetings, cricket matches, etc., need not be too assiduous, but may prove useful.

* * *

Washing Economy. In these days of higher water charges it behoves every photographer to look to the efficiency of his washing appliances. The photographer, with his reputation to preserve, cannot afford to risk the permanency of his prints or negatives by insufficient washing, but many ways of washing are not only wasteful of water but very inefficient. The rapidity with which hypo can be eliminated from paper or gelatine depends on the rate with which fresh water is brought to the surface of the film and the contaminated water removed; the actual velocity of the stream greatly assisting the hypo to diffuse out. A thin stream of water in rapid motion, which passes over every part of the surface to be washed, would be more efficient than, *e.g.*, to place the prints at the bottom of a large vessel with a large quantity of water flowing in and out, the majority of which does not reach the paper. With these ideas in mind it would not be difficult for the photographer to examine the efficiency of his washing system and to improve it.

* * *

Wide-Angle Groups. The very unpleasant effect caused by the use of a wide angle lens for taking flashlight groups, whereby the faces near the lower corners are drawn out until they are almost unrecognisable, is due, not, as is often supposed, to any shortcoming in the lens, but to the laws of plane perspective. No optical device is capable of modifying it. Although this should be known to all photographers of any experience, such does not appear to be the case. We recently heard the effect attributed to astigmatism, the idea being that the faces were broadened by the same process as a disc is represented as an ellipse near the edge of the field of an astigmatic lens. This is, of course, a complete misconception, for the same thing will occur if a pinhole be used in place of a lens. The effect is not produced if a panoramic camera of the Al Vista or Cirkut types is used, but this cannot be done with flashlights, and, moreover, the perspective rendering of an interior with such a camera would be unacceptable. The best plan to adopt is to endeavour to group as many figures in the centre of the foreground and to leave as much as possible of the bottom corners of the plate as can be managed free from members of the group.

HAND AND STAND CAMERAS.

THE photographer who is contemplating the purchase of a small camera, say, a half-plate size, is often in doubt as to which model will be the most serviceable. If the expense be no object, then it is not advisable to endeavour to obtain all the desiderata in one instrument, but to procure separate ones for different classes of work. As this is, however, rarely the case, it may be profitable to review the capabilities of the various types of general purpose cameras now on the market. It will, perhaps, simplify matters if we assume that the immediate object is to secure a series of negatives suitable for postcard views, the subjects ranging from beach scenes to church interiors, comprising also architectural details, objects in the local museum, and the like. For most of these subjects the ordinary parallel-bellows camera would certainly be the most convenient, but the principles on which it is constructed are most unsuited for hand-camera work, so that it must be passed by. The conical-bellows field camera is not much better, as it is not usually built so as to be conveniently held and manipulated in the hand, and the setting up on a tripod for every subject is rather troublesome.

It appears, then, that a camera which is constructed with a view to being used in the hand, but possesses all the adjustments of the ordinary field camera, is most likely to give satisfaction. The prototype of all the current models was the "box-form" camera of George Hare, the first camera which was made commercially to close up with the lens and shutter *in situ*. As the lens was a rapid rectilinear projecting its full length from the front, and the shutter was a before-lens roller blind, the apparatus was somewhat clumsy, but the idea was sound, and shorter lens tubes and between-lens shutters made the way clear for such cameras as the Watson "Alpha," the "Sanderson," the "Sinclair Una," and the Dallmeyer "Correspondent." These and several other cameras have the following features in common: a lens and shutter permanently fixed to the camera front ready to be drawn out to an "infinity catch," nearer distances being focussed by rack and pinion; a double-extension bellows; a rising front and reversing and swing back. A focussing scale and finder are also provided. Moreover, some cameras of this type have also the "wide angle movement," which permits of the use of very short focus lenses without cutting off by the baseboard. Even if this movement is missing, it is not a serious defect, if both front and back of the camera are made to swing as they generally are. Besides the normal lens supplied with the camera it is possible to use both wide angle and long-focus or even a telephoto lens when needed, while the front lens-shutter may be supplemented or superseded by a focal-plane one, at the expense of a little extra weight and bulk.

Cameras made primarily for hand or "snapshot" exposures have more capabilities for stand work than their owners usually realise. A well-known humourist once wrote in gleeful terms of his discovery that his fountain pen was an extremely useful instrument when used in conjunction with an inkstand; and it may be said of a reflex camera that it serves well when used on a stand with the mirror and shutter out of action. There is the disadvantage of the absence of a swing back, and

a rather limited range of rise to the front, but even with these drawbacks much useful work can be done. With the mirror out of the way it is generally possible to fit a short focus lens in a sunk front, which adds considerably to the utility of the instrument. It is hardly necessary to point out that the tripod should be of sufficient strength and rigidity to support so heavy a camera. An aluminium tubular stand is not to be recommended for a reflex.

The collapsible or Anschütz type, while being more portable than the reflex, is better adapted for tripod work, for, except for the want of a swing back, it is capable of doing almost any class of work. As these cameras are usually fitted with very rapid lenses, they are suitable for home portraiture. It should be remembered that extension bodies permitting the use of long-focus lenses can be fitted to this type, although in most cases a Telecentric or similar telephoto lens, which gives double the equivalent focal length at the normal extension will be found the most convenient. With either this type of camera or any other which is provided with a focal-plane shutter, it is advisable to use a cap for time exposures, unless the tripod is unusually rigid.

Roll film and magazine cameras which have no focussing screens, can, of course, be used upon a tripod, but the difficulty of insuring exact agreement between the image in the finder and that upon the film, especially when the rising front has to be used, rather takes them out of the class of hand and stand cameras. To work with any degree of certainty a plate attachment with a focussing screen should be fitted when the Kodak becomes virtually an ordinary camera.

There are many folding cameras in which the back is supported by slotted bars which are held at a fixed point by a spring; it is usually quite possible to fit one or both struts with a clamping screw, so that a swing-back movement can be obtained.

In selecting a hand-and-stand camera, great care should be taken to obtain one which has a very solidly constructed front. Thin single metal supports cannot be relied upon to keep true, and when this is no longer the case, the working of a rapid lens is seriously handicapped. For use in the hand as a direct-vision finder, either a wire frame or a concave lens will be found more convenient than the usual brilliant or ground glass finder with a mirror; the experience of Press photographers has proved that the eye-level position is the most practical one.

THE QUANTUM THEORY OF PHOTOGRAPHIC EXPOSURE: A CRITICISM.

(A communication from the British Photographic Research Association.)

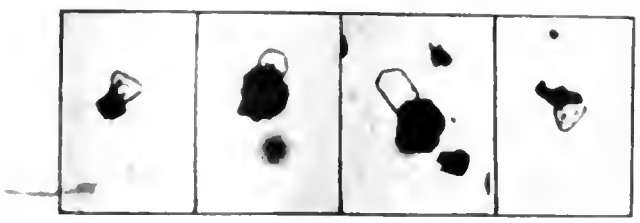
Two very interesting papers have recently been published in the "Phil. Mag." dealing with a light-quantum theory of photographic exposure. The theoretical side of the question has been exhaustively studied by Silberstein, and Trivelli and Righter claim that preliminary experiments by them support the theory to a pronounced degree. It is not necessary to quote details as to the theory—it has already been put forward in a more or less popular way by Silberstein and Mees in a recent issue of this Journal ("B.J.," 1922, June 30, pp. 384-387). The equation derived by Silberstein, which, he says, under the conditions prevailing in all practicable experimental cases, is of more than sufficient mathematical accuracy, is

$$k = N(1 - e^{-an}),$$

where a = area of the grain,
k = number of grains hit,
N = total number of grains per unit area,
n = number of light-quanta impinging upon unit area.

Any new advances in knowledge are open to criticism, and such criticism is now given of the papers in question. Trivelli and Righter state that they are able to test Silberstein's formula connecting the fraction changed with the area of the grain very severely by using not only single grains of different sizes, but also clumps of any number of grains up to as many as 33 in a clump. They claim that this is permissible *because grains when clumped together act as one grain for development to the limit*. They consider as untrue Slade and Higson's statement that "One grain which has become developable is unable to make a grain, situated in close proximity to it developable, unless the latter grain is developable in itself." In the paper by Mees and Silberstein it is apparently admitted that the brilliant experiments of Svedberg's have definitely proved that Slade and Higson's statement is correct in the case of small spherical grains. Mees and Silberstein merely suggest this is due to the fact that these very small grains are not in such close contact as the larger flat ones.

On what is this statement of Trivelli and Righter based? In their paper they give the results of their experiments, which, it is claimed, show that within a given emulsion, exposed and developed, the percentage of clumps of grains which are changed increases with the area of the clump. They say that "from the table it is readily seen that this statement (of Slade and Higson) is not true." It is difficult to see how this is proved by the experimental results; in fact, it will be shown later that these are just the kind of results to be expected if Slade and Higson's statement *is true*. In any case, if Trivelli and Righter's statements are correct, it should be impossible in an emulsion containing large flat grains ever to find a case in which, of two or more grains in contact, only



one of them is developed, when development is carried to the limit. As a matter of fact, it is possible to show hundreds of such cases—and a few examples are given in the figure. Of course, it is not believed that these grains are ever in real optical contact; if they were, they would, naturally enough, act as a single grain. The conditions in the emulsion are such that they are almost sure to be separated by a fine film of gelatine. But there is no reason why the grains in Trivelli and Righter's experiments should be closer in contact than they are in the cases shown here, since both diluted emulsions were made in a similar manner. It will be seen from the figure that both the developed and the undeveloped grains are quite sharply in focus and since the magnification is about

2,000, they must be very near together. It seems very improbable that these differences are due simply to the different emulsions used, since they are both of the same type, i.e., flat grains. It would be interesting to know if Trivelli and Righter have ever examined their emulsion before de-silvering, and found it impossible to observe a single case of a developed and undeveloped grain together. This seems the most natural thing to do, but there is no reference to such an experiment in their paper.

Silberstein states that "the chief and most immediate consequence of the proposed theory is the essential dependence of the proportionate number of grains affected, k/N, on the size a of the grain, i.e., according to the equation

$$k/N = 1 - e^{-na}$$

$$\text{or } \log\left(\frac{N}{N-k}\right) = na.$$

Now n is the number of light-quanta impinging on the plate, and is therefore constant for a given exposure. The first obvious test of this equation is to take the case of sets of single grains (so as to avoid the question of clumping altogether), and to measure accurately every grain counted. Considering two sizes of grain, say a_1 and a_2, with number changed k_1 and k_2 respectively, we shall have

$$\log\left(\frac{N}{N-k_1}\right) = n.a_1.$$

$$\text{and } \log\left(\frac{N}{N-k_2}\right) = n.a_2$$

$$\text{or denoting } \log\left(\frac{N}{N-k_1}\right) \text{ by } A_1 \text{ and } \log\left(\frac{N}{N-k_2}\right) \text{ by } A_2,$$

$$A_1/A_2 = a_1/a_2$$

i.e., the ratio of A_1/A_2 is independent of the exposure. This experiment has already been carried out in our laboratories, and the results, which are to be published in the "Phil. Mag." (in the press), show that this relation does not hold, and that A_1/A_2 varies enormously with the exposure. It is shown there how easily this can be explained on the basis of the existence in the grains of specially light-sensitive points. Silberstein states that the fact "that out of a number of apparently equal grains subjected to a sufficiently weak exposure one or two are affected, while the others—nay, their next neighbours—remain perfectly intact," is a tangible proof of the correctness of the assumption of spatially discrete as against continuous (light) action. He even says: "It would be in vain to ascribe to these survivors a greater immunity or indifference to light." It is difficult to see any justification for such a statement as this; surely when two grains act differently under the influence of light, the first and most natural assumption of all is that the grains themselves are different; from the chemical point of view there is no reason why this should not be the case.

Trivelli and Righter's experimental method is, apparently, as follows:—In the single-layer emulsion which they prepare, the grains, which are of varying sizes, are sometimes found clumped together in groups. This emulsion is exposed to a certain intensity, developed, and before any examination is made the silver is dissolved out by means of a de-silvering solution. The counting of the number of clumps of various sizes in a given area is then carried out microscopically, and the percentage of clumps of each size which are changed is determined in the same manner as by Svedberg. The authors find that the percentage of clumps changed increases with the size of the clump.

Now it is not difficult to see that this result would also be obtained if a clump did *not* act as one grain, *i.e.*, if each grain which is changed to silver is developable in itself, as stated by Slade and Higson. For simplicity consider only grains of one definite size, and let there be, say, 70 per cent. of the single grains unchanged, or 30 per cent. developed. Then of every 100 single grains which are examined 70 will be unchanged, no matter what is the size of the clump in which they are. Thus to find the percentage of clumps of two which are changed, we have the familiar probability problem of finding the chance of drawing two white balls (unchanged grains) from a bag containing 70 white balls and 30 black (developed grains), the balls being drawn in pairs. This can be shown to be equal to 0.488. Thus the percentage of clumps of two which still remain as two unchanged grains after exposure is 48.8. If the plate had been de-silverised, so that there were no clumps of 1 changed and 1 unchanged, or two changed, and if there were no clumps of more than two grains, then the percentage of clumps of 2 changed would be counted as $100 - 48.8 = 51.2$, as against 30 for the single grains. Similarly, a larger percentage still would be obtained for clumps of three.

If each grain changed must be developable in itself, the process of de-silvering introduces a serious error. Thus, for example, in counting the number of unchanged singles in the exposed portion, what is really counted is the number of grains which were singles all the time, plus clumps of two of which one has been changed, plus clumps of three of which two have been changed, and so on. Thus the number of undeveloped *singles*, as determined by counting, is really too large or the percentage changed too small.

It would be very interesting if Trivelli and Righter carried out an experiment with grains of one size only without dissolving away the silver—counting the percentage of clumps of two having two, one and zero unchanged grains. It is ventured to predict that their results would fit in with simple probability calculations like that shown here. Unfortunately, one cannot test in this way the numbers given in their table, because the grain size is not constant for all sizes of clumps.

As yet, it is impossible to accept the experimental evidence as strongly supporting Silberstein's theory. In the paper in this Journal three tables are given, and the authors state that the experimental and theoretical results "agree admirably." This is a matter of opinion. It seems very optimistic to say that such pairs of values as 76.6 and 68.9, 21 and 28.2, 87.5 and 81, 25 and 38, 56 and 66, 63 and 82, 68 and 86, 76 and 89 show admirable agreement.

F. C. Toy, M.Sc., F.Inst.P., F.R.P.S.

A Market for Photographs.—On a recent occasion we had the pleasure of renewing our acquaintance with Mr. Franklin L. Fisher, chief of the illustrations division of perhaps the most important illustrated journal, namely, the "National Geographic Magazine," published in Washington, by the National Geographic Society. Mr. Fisher was upon one of his periodical visits to Europe, gathering photographic illustrations for the use of his magazine, and he left with us a copy of a booklet which has been produced for the guidance and information of photographers able to supply some of the many and varied demands of the "National Geographic Magazine" for photographic illustrations. It is of interest to note that within the last few years the National Geographic Society, by adopting the policy of making its journal of popular interest, largely by the lavish use of photographs, has increased its membership to 700,000, and may well claim to be the largest educational association in the world. Although following many other activities, its "Magazine," with a circulation of nearly three-quarters of a million, occupies a large place in its programme, and no pains are spared to add to the attractiveness of its pages by the selection of choice photographs, and by the finest engraving and printing. The editor of the magazine uses approximately 2,000 photographs per annum, and a fair number of Autochromes which are reproduced in colours. The booklet to which we have referred fully describes the classes of subject, the technical qualities which recommend photographs for use in the magazine, terms of payment, etc. Photographers throughout the world are invited to send for this publication, which is obtainable free on application to the National Geographic Magazine, 16th and M. Streets, N.W., Washington, D.C., U.S.A. The booklet gives the fullest particulars, and is illustrated by some dozen large reproductions of photographs (from all parts of the world) of a kind which are suitable.

NOTES ON THE FOCAL-PLANE SHUTTER.

[In an article recently published in "American Photography" the author, Mr. Charles T. Jacobs, usefully draws attention to some of the properties of the focal-plane shutter which are often neglected, in particular to the variability of its efficiency, chiefly according to the width of the slit and the distance of the latter from the plate. Inasmuch as greater efficiency can often be secured in practice by working with a wider slit and a higher spring tension instead of with a narrower slit and a lower tension, what he has to say on this subject is deserving of a careful reading. We, therefore, reprint his paper, although we cannot altogether agree with his unqualified advocacy of the focal-plane shutter, for we think that he does not take a sufficiently serious view of its more complicated construction and liability to derangement as compared with a between-lens shutter. In cold climates, also, the stiffness of the blind which results from a low temperature is a very practical drawback.]

The writer has often been surprised at the general lack of familiarity with the focal-plane shutter. Many have only very vague ideas as to its construction and operation, while others are totally unaware of the existence of a shutter radically different in design from the usual between-lens type. This is an extremely unfortunate condition, as the focal-plane shutter has several undeniable advantages over the lens shutter, and doubtless many who would otherwise invest in and use one fail to do so simply through ignorance or a misimpression of this shutter.

Among the points of general superiority of the focal-plane shutter are its greater speed and greater efficiency, as well as the possibility of changing the lenses on the camera without the necessity of a separate shutter for each lens, owing to the fact that the focal-plane shutter is built into the camera, not the lens mount. A less general advantage, but an immense one nevertheless, is its adaptability to the reflecting camera—indeed, it has made possible that instrument as we know it to-day.

Of course, there have been arguments brought forward against the use of the focal-plane shutter. Among the objections to its use, we hear that it takes more space, necessitating a larger instrument, that it distorts, and that it is not as simple in construction or operation as the lens shutter. As for the first, focal-plane shutters are fitted to small cameras, so that it can hardly be argued that this point is a very serious one. Regarding the second, it is quite true that the shutter distorts on occasions where there is extremely rapid motion of the subject. But in cases where this is really noticeable the subject will be found to be one beyond the capacity of the between-lens shutter, and surely a slightly distorted image is to be preferred to none at all. Finally, the claim that the shutter is more complex in construction and operation than the lens shutter, while possibly true to a limited extent, is robbed of its formidability once one grasps the underlying principle of the instrument, which is really simpler than that of the between-lens type.

The focal-plane shutter is not placed anywhere near the lens, but instead is operated just in front of the plate, which lies in the focal plane of the lens—hence the name given the shutter. It is merely an opaque blind running between two rollers, one above and one below the plate (in a few models one on either side). The blind is wider than the plate, and its edges run in grooves so that no light can creep around. In the blind are one or more crosswise slits, each as long as the plate is wide. Normally no slit lies in front of the plate, the blind here being unbroken, and acting as does the slide of a plate-holder in protecting the plate from the light admitted by the lens. When the shutter is released, however, the blind is moved at high speed from one roller to the other, far enough for one of the slits to pass in front of the plate, momentarily admitting to it the light from the lens, thus making the exposure.

Consideration will reveal that the exposure of the plate is not the time elapsing between the starting and stopping of the blind, but rather the length of time any one point is uncovered. This time depends on two factors—the speed with which the blind travels and the width of the slit. The former is governed by the tension under which the pulling roller (usually the lower) is held. This is usually adjustable, but on some models is automatically taken care of. The second factor—the width of the slit—is, of course, a variable one. There are two ways of obtaining this variation—the use of a blind with several slits each of different width, and the use of one with a single slit of adjustable width.

The first of these two types is the simpler of the two, but requires a longer blind, as between each slit and the next there must be enough solid curtain to cover the plate. The mechanism is so arranged that only one slit passes in front of the plate when the shutter is released. After one exposure the instrument is ready for an exposure with the next wider slit. Should a still wider slit be required, the shutter must be released, the plate being protected while this is being done. On the other hand, should it be desired to use the original slit again, the blind must be wound back one slit—or if a still narrower slit is wanted, still further. This re-winding is done by a key on the outside of the instrument, and while it is being done (as well as when the shutter is being released for purposes of setting as mentioned above) the plate must be protected from the lens. In a reflex camera this is easily done by means of the mirror. In any other camera, however, the slide must be inserted in the plate-holder, or the lens capped.

The second type of blind, though a little more complex in construction, is possibly a trifle simpler in operation. It is made in two parts, so arranged that the distance between them is variable. This variable space constitutes the exposure slit, and its width is adjustable from a very narrow opening to the full height of the plate. The shutter must be rewound after each exposure, the distance the key is turned in re-winding usually governing the width of the slit. On many models it is possible, without releasing the shutter, to alter the width of the slit, in one direction at least, after the shutter has once been wound. This is a great convenience in cases where it is found that the subject to be photographed calls for a different exposure than that for which the shutter has already been set. Some shutters with this type of blind are known as "self-capping." That is, the two parts of the blind are made to overlap while re-winding is going on, thus obviating the necessity of protecting the plate in any other way. This is a particular advantage on cameras other than reflexes, as they have no mirror which can be conveniently used for protection of the plate.

The range of instantaneous speeds obtainable with the focal plane shutter is from about one-tenth of a second to one one-thousandth of a second on most models. Besides these speeds, time exposures are possible with either type of blind. The largest slit in either case is as wide as the height of the plate, and can be stopped in front of it. This permits focussing at the back of the camera, as well as time exposures of any duration, which latter can be terminated by simply releasing the shutter. Bulb exposures are usually possible as well—i.e., the largest opening can be brought in front of the plate by pressing on the release, and it will remain there until the pressure on the release is terminated. An automatic adaptation of the bulb exposure is often included, by which exposures in the neighbourhood of one-fifth of a second to a whole second are obtainable.

The way in which the exposure obtained at any setting of the shutter is indicated varies on different instruments. In some cases (usually where there is no external tension adjustment) the exposure is indicated directly at the key, or is automatically registered nearby. In, probably, most cases,

however, a table is supplied with the shutter, usually attached to the camera, showing the exposure obtained with any combination of blind slit and tension. A little examination of a table of this kind shows that in many cases the same exposure can be obtained with one tension and slit as results from the use of a higher tension and wider slit. The natural inference is that the two are equivalent in every respect, and hence that there is no preference, in theory, as to which is used. This is not strictly so, as this brings in a question of the efficiency of the shutter, which is greater in some cases than in others. Naturally, it is desirable to understand this subject so that the shutter can be used at greatest efficiency, particularly when light conditions are bad and motion of the subject exists.

The efficiency of a shutter at any exposure is the ratio of (*a*) the amount of light actually admitted to the plate to (*b*) the amount which would be admitted were the lens fully uncovered as long as it is uncovered at all. Thus in the lens shutter, where a good portion of the time of exposure is consumed in the opening and closing of the leaves, the efficiency is poor, falling to less than one-half—or 50 per cent.—in many cases. The efficiency of the focal-plane shutter, on the other hand, is usually quite high. It is often argued that, owing to its peculiar construction, it is really 100 per cent. efficient. This is not so, as to fulfil this desirable condition the plane of the blind would have to coincide with that of the plate—a manifest physical impossibility. Usually the blind sets about $\frac{3}{8}$ of an inch, or one centimetre, away from the plate. On some film cameras fitted with the focal-plane shutter this distance is reduced to $\frac{1}{8}$ of an inch—a decided improvement. On the other hand, it is often greater than $\frac{3}{8}$ of an inch, a condition not to be desired, as the nearer the blind is brought to the plate the greater will be the efficiency of the shutter, other conditions being equal.

To get a rational idea of the light-action on the plate when the focal-plane shutter is used, an individual point on the plate must be considered. As the blind is operated (let us assume downward, as is usually the case), the first direct ray of light from the lens is received by any point just as the lower edge of the slit passes the imaginary line between the point and the top of the lens. A tiny space of time elapses before this edge lines up between the point and the bottom of the lens, and during this time the lens is being uncovered to the point. For a time, then, the lens acts fully on the point. Then the top of the slit comes in line between the point and the top of the lens, and as the blind continues to move the lens is covered, so far as the point is concerned, from the top downward. So even in the focal-plane shutter some time is consumed in uncovering and covering the lens—considered from the position of a single point on the plate. As all the points on the plate receive the same exposure, this is true for the whole plate. The time is usually but a very small portion of the total exposure, however, and so it is rarely that the efficiency of the focal-plane shutter drops to the neighbourhood of that of the lens shutter.

Focal-plane efficiency depends on three factors: viz., lens aperture used, width of slit employed, and distance of blind from plate. If the first is expressed by its *f* number, and the second and third in the same units ($\frac{1}{8}$ inch is preferable to 1 inch in the English system, as it avoids fractions), it can be shown that if the shutter speed is uniform:

$$\text{Efficiency} = \frac{\text{Lens aperture} \times \text{Width of slit}}{(\text{Lens aperture} \times \text{Width of slit}) + \text{Blind distance}}$$

From this it may be seen that the efficiency of the same instrument depends only on the product of the lens aperture and shutter slit employed, as blind distance is constant. It is merely necessary to divide this product by itself plus the blind distance, and the efficiency is obtained, expressed as a fraction. It can be obtained in per cent. by multiplying this result by 100. It is absolutely necessary, however, that in using this formula the lens aperture be considered by its *f* number, and the shutter slit and blind distance be measured in the same unit. The accuracy of the figure obtained will depend, of course, on how near an even speed is maintained by the blind throughout the exposure. In modern instruments the variation in speed in the same exposure is very slight, owing to the perfection which the shutters have attained.

Speed work is the particular field in which efficiency is important. The reason is two-fold. First, the exposures which can be given are so short, owing to motion of the subject, that under-exposure is bound to result, making it desirable to get the maximum light-action on the plate in the time available. Secondly, the short exposure, with its narrow slit, and the wide aperture which must be used in the lens, are the very conditions under which the efficiency of the focal-plane shutter drops badly. There is one thing which can be done, however, to increase efficiency—use the highest tension the instrument affords, as this will permit a wider shutter slit without increasing the length of exposure. On instruments where there is no tension adjustment for the operator to use, it will be found that at the lower slit widths the tension automatically increases. Incidentally it might be mentioned that the high tension will help to minimise the distortion produced by this shutter, mention of which was made above.

In cases, however, where efficiency is fairly high in any event—i.e., on the longer exposures with smaller apertures of the lens—it may be advisable to use a lower tension, as higher ones are certainly harder on the mechanism of the instrument. The difference in efficiency caused in a case of this kind by halving or even quartering the shutter slit to compensate for the decreased tension is not sufficient to be of great account. It is only as the faster exposures and wider apertures are used that it behoves the user of the focal-plane shutter to concern himself with the efficiency of his instrument, which is very high in all other cases.

There is one penchant of the focal-plane user which certainly operates to his disadvantage in many cases—the mania for the use of a high speed when it is not necessary. Some people are so obsessed with the idea that the focal-plane shutter is nothing but a speed instrument that they use the higher speeds all the time. Nothing is more ridiculous, especially in cases where the rendering of the subject would be improved by the use of a smaller lens aperture and correspondingly longer exposure. Under-exposure often results from this practice of using the faster exposures, not only because it is often carried so far that correct exposure cannot possibly result, but also because the varying efficiency of the focal-plane shutter at different settings upsets the equivalence of different combinations of lens apertures and exposures. Thus, though 1-50 of a second at *f*/16 and 1-400 of a second at *f*/5.6 are theoretically the same, the latter setting with the focal-plane shutter would not admit as much light as the former, owing to considerably decreased efficiency.

Because of its high efficiency at the slower exposures, even when used with a wide aperture at the lens, the focal-plane shutter is a fine instrument for photography where the light is poor, and when with the ordinary shutter an instantaneous exposure is precluded. This feature of its use is often overlooked by those who consider it first, last and always a speed instrument.

It is hoped that more people will be brought to realise that in the focal-plane shutter they have an instrument which, with almost no exception, will do all that the lens shutter will, and a lot besides—an instrument not built for one single class of work, but for all conditions—and an instrument which is flexible enough to do them all justice.

CHAS. T. JACOBS.

NEW SPANISH CUSTOMS TARIFF.—Several important changes are notified in the New Spanish Customs tariff. Those affecting the photographic trade are:—Hand photographic apparatus up to 13 x 18 cm. and stereoscopic apparatus of any size, 10 pes. per kileg. Photographic apparatus for the studio, and hand photographic apparatus 13 x 18 cm. or *larger* (both without objectives), stereoscopes, cinematographs with their parts and photographic accessories, such as amplifiers, projection apparatus, *wooden or metal frames*, tripods and the like, 1 pes. per kilog.

RECOVERY OF SILVER FROM FIXING BATHS, ETC.

In the current issue of the "Journal of the Society of Chemical Industry," Mr. E. Gardner has a note on the recovery of silver from photographic waste solutions and also from those used in the glass-silvering and electro-plating trades. The following is the portion of the communication which deals with photographic solutions. It will be seen that Mr. Gardner recommends clean scrap iron for the reduction of silver in preference to the commonly used "liver of sulphur."

Comparatively large quantities of silver, gold, and platinum are used in photography, glass-silvering and chemical gilding, electro-plating and other industries, but relatively very small amounts are recovered from spent solutions owing to ignorance of simple and cheap methods of recovery. In the first three trades mentioned above, over 2 million ounces of silver nitrate, worth £200,000, is consumed yearly in Great Britain; of this amount more than three-quarters is used in photography and most of the silver content is lost irretrievably.

The spent solutions produced by the photographer comprise toning-baths, fixing-baths, and various washing waters. Taking an average print on self-toning paper, about 85 per cent. of the silver originally present goes into the preliminary wash-water and fixing baths, 5—8 per cent. remains in the print, and the remainder passes away in the final washing.

Of the methods of recovery recommended in text-books on photography, precipitation of silver from fixing-baths and wash waters by means of "liver of sulphur" does not produce a precipitate that settles well, and contamination with polysulphide, or any sulphides, is to be avoided where photographic materials

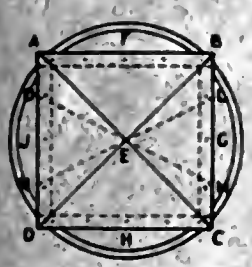


Fig. 1.—Top view of filter.

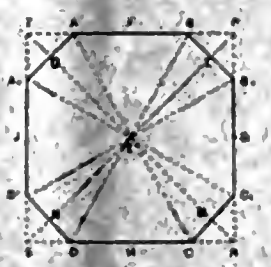


Fig. 2.—Filter cloth removed from frame, showing folds.

are used. Precipitation of gold from toning-baths by ferrous sulphate is not satisfactory for cold and very dilute solutions, especially when thiocyanates are present; and there are much better reducing agents than ferrous oxalate for precipitating platinum.

The method recommended by the writer is to collect all solutions in a wooden vessel and to precipitate with clean scrap iron. Reduction is complete within 24 hours, heating is unnecessary, and the precipitate settles very satisfactorily. Two wooden casks should be used for continuous photographic work, one being used for charging and precipitating while the precipitate is settling in the other. The clear liquid is siphoned off.

At the yearly clean-up the precipitate is passed with water through a coarse sieve (6 holes to the linear inch) to separate undissolved iron, drained on a calico filter, washed with hot water, placed with the cloth in an enamel dish, and dried at a gentle heat. The precipitate should not be dried completely otherwise it may ignite spontaneously. It consists of impure metallic silver and possibly gold and platinum, and is technically termed "foots," an Anglo-Saxon word meaning the dregs or lees settling from a liquor. The operation of obtaining the precipitate may be called "footing."

The precious metals in paper cuttings, spoiled prints, etc., may be recovered by incinerating the material, if necessary after moistening with a solution of alkali nitrate, and adding it to the footing cask. Great care is required in burning celluloid films. Spoiled plates should be fixed, but negatives are not worth stripping. Batches of spoiled emulsion should be liquefied in warm water and treated with scrap iron in a separate cask, as they are very rich in silver. It is recommended that the collected precipitates be sent direct to a refinery; it is useless to send dilute solutions to a refinery as the freight on these will leave no margin of profit.

A few instructions on the making of square calico filters for these precipitates may be of use.

A square wooden frame is made of such size that its corners will just rest on the edge of the deep circular vessel into which it is proposed to filter. The frame may be, for example, 14 in. square and 3 in. deep and made of batten 1 in. thick, thus leaving an inner opening of 12 in. square.

From a piece of new, closely woven calico, washed to remove dressing and dried, cut an exact square of 24 in. side, mark the middle of each side and the middle of each upper edge of the frame, which may be conveniently standing on the circular vessel (Fig. 1). Taking the middle of each cloth-edge in turn, and doubling ½ in. underneath to strengthen it, fasten it temporarily by means of copper tacks to the middle-points, F, G, H, J, of the upper edges of the frame, leaving the slack of the cloth hanging inside.

On the side A B, draw the cloth-edge tight from its central tack, double ½ in. underneath as before, and fasten it with a tack almost at the corner B; repeat this with the other half of the same edge towards corner A. Turn the frame round and deal similarliy with side C D. These two sides are now finished and are represented in the diagram of the unfolded cloth taken from the frame by the same letters (Fig. 2).

Taking side B C, hold the cloth-edge in one hand at a point B_1 (Fig. 2), 6.5 in. from the central tack, double ½ in. underneath as before, slightly raise it from the frame, and with the other hand fold neatly along the line E P. Bring the point B_1 exactly down to the corner B of the frame and fasten it there with a tack; treat the similar points C_1, D_1, and A_1 in the same way.

The cloth ought now to form a perfectly regular inverted pyramid inside the frame, and if not, some slight adjustment must be made. Each side will consist of one layer of cloth, but underneath the smaller triangles EBL, EMC, EDN, and EOA, in Fig. 1 there will be two extra layers. Drive the tacks home, add a few extra ones, and trim off the four ears of cloth which project beyond the frame (the triangles AA_1T, BB_1P, CC_1R, and DD_1S in Fig. 2).

The filter is now ready for use. Some boiling water is first passed through. Then a little precipitate is put in to form a filter bed, and as soon as the filtrate runs clear the filtration is proceeded with, care being taken that the filter does not run dry before all the precipitate is placed on the cloth. Finally, remove the soluble salts by washing a few times with hot water.

In packing precipitates before sending them to a refinery, care should be taken not to use metal boxes. A precipitate like moist silver chloride rapidly attacks iron or zinc, and foots powders often retain sufficient acid to corrode a metallic container. Well-made wooden boxes or jars of glass or earthenware should be used.

E. GARDNER.

FORTHCOMING EXHIBITIONS.

August 26 to September 9.—Toronto Camera Club. Secretary, J. H. Mackay, Toronto Camera Club, 2, Gould Street, Toronto, Canada.

September 9 to October 7.—London Salon of Photography. Latest date for entries, August 30. Particulars from the Hon. Secretary, London Salon of Photography, 5a, Pall Mall East, London, S.W.1.

September 11 to 15.—Professional Photographers' Association, Princes Galleries, Piccadilly, London, W. (Trade and Professional). Hon. Secretary, Richard N. Speaight, 157, New Bond Street, London, W.1. Also foreign invitation loan exhibition of professional portraiture. Hon. Secretary, Marcus Adams, 43, Dover Street, London, W.1. Latest day for entries and exhibits, August 31.

September 18 to October 28.—Royal Photographic Society Annual Exhibition. Latest date for entries, August 25 (carrier); August 26 (hand). Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

October 18 to 28.—Portsmouth Camera Club. Latest dates: Entry forms, October 11; exhibits, October 16. Particulars from the Hon. Secretary, C. C. Davies, 25, Stubbington Avenue, North End, Portsmouth.

Patent News.

Process patents applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, July 10 to 15:—

DEVELOPMENT.—No. 19,442. Device for developing, washing and finishing photographic films and prints. S. H. Morse.

REPRODUCTION PROCESS.—No. 19,515. Photographic reproduction process. E. Doelker.

TELEGRAPHIC TRANSMISSION.—No. 19,205. Transmission of photographic images. P. and U. Ellero.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

LANTERN CONDENSERS.—No. 179,849. (June 24, 1921.) Fig. 1 is a diagram representing an ordinary condenser with its source of light and the course of the light; and fig. 2 is a similar diagram of a condenser according to the invention.

In fig. 2 the first two lenses c and *d*, located at the end of the condenser adjacent to the source of light *q*, are converging menisci presenting to the source of light concave surfaces of such curvatures that the rays of light incident thereon from the source *q* (which is, as shown, in close proximity to the lens c) are, owing to the gradual increase of the angle of incidence from the optical axis outwards, partly reflected to such a degree as to counter-

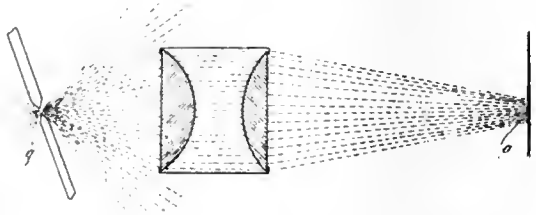


Fig. 1.

balance the diminution of absorption of light due to decreasing lens thickness with increasing distance from the optical axis. The first lens c is placed as near to the source *q* as practically allowed by the dimensions of the condenser. Theoretically the focal-length of the condenser might be so small that the lens would be in contact with the source of light, but practically it has been found that a focal-length as small as 11 millimetres may be employed, so that the condenser may be used with the lens c very close to the source of light.

The third and fourth lenses e and *f* are plano-convex lenses, whose convex surfaces are arranged to face each other.

By the second lens *d* the rays are directed substantially parallelly upon the third lens e, and the result is that a practically

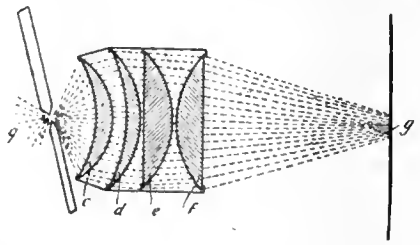


Fig. 2.

uniform pencil of rays is directed to the window *g* of the apparatus by the lenses e and *f*.

The following are dimensional particulars of a condenser made according to the invention; the focal length of the lens c is 230 mm., that of the lens *d* 300 mm., that of the lens e 180 mm., that of the lens *f* 180—450 mm., according to the focal length desired for the condenser; the radii of curvature of the concave surfaces of the lenses c and *d* are 120 and 135 mm. respectively; whilst the distances apart of the margins of the lenses c and *d*, *d* and e, and e and *f* are 28, 34, and 37 mm. respectively.—Kurt Morsbach, 12 Kloste: Strasse, Bad Oeynhausen, Germany.

FLASHLAMPS AND IGNITION.—No. 176,468 (December 1, 1920). The lamp casing *a* which may be of box-like formation and provided with a glass front a^2, is mounted at the upper end of a pair of telescopic tubular members *b* b^1. Preferably the lamp casing *a* is made to contain a pair of troughs c c^1 (for the magnesium) both of which are provided with adjustable covers *d* d^1, so that one only can be used at a time. The two covers *d* d^1 are formed back to back and turn about a common pivot pin e and the connecting arms thereon are adapted to co-operate with pairs of contact fingers *f* f^1 to make the required connection for the particular tray in use. At a suitable position in the case *a* is an opening a^1 which is covered by wire netting *g* enclosing a smoke-proof cloth or screen g^1 to blow out or

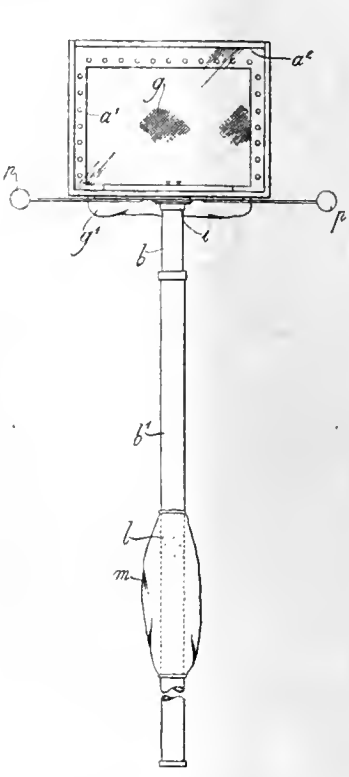


Fig. 1.

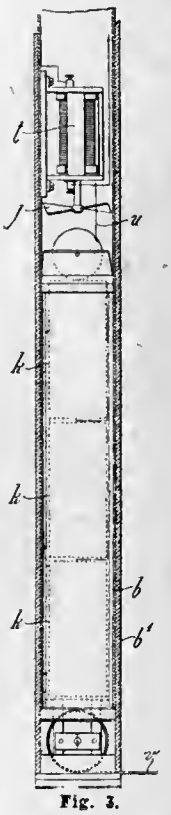


Fig. 3.

receive and thereby permit of the escape of the pressure of gas caused by the ignition.

At the upper end of the lamp casing *a* is a mica flap valve *h* adapted to be closed by the pressure from within, but to be normally open to admit of the ingress of fresh air. The telescopic tubes *b* b^1 are connected to the lamp box *a* at *i*, and within one of the tubes is arranged an electric fan *j* and one or more storage batteries *k k k* adapted to actuate it and also to provide the necessary E.M.F. to ignite the charges of magnesium. As the batteries *k* are arranged in the lower tube b^1 and the motor in the upper of the tubes, adjustable electrical connection is made by means of a coiled tape *u* wound on a spring drum after the manner of a flexible measuring tape, the other battery contact being likewise connected to earth.

At the lower end of the telescopic tubes *b* b^1 are provided a series of perforations *l* enclosed by a filtering cloth *m*. The arrangement of the magnesium trays c c^1 is such that the lids or covers *d* d^1 thereof are adapted to control the electric circuits; that is to say, the opening of one lid d^1 of the trough c^1 will connect up the circuits of that particular trough, whilst the closing of the other lid *d* will cut out those of the other trough c.

For controlling the passage of current through this circuit there are (in connection with a wireless coherer *n* or other detector and

a pair of capacities *p* adapted to receive from the wireless actuating apparatus), a relay *q* and batteries *o* and an earthed circuit, the latter of which is adapted to be closed by the relay. The arrangement is such that the coherer *n* is only adapted to actuate the relay *q* and permit the passage of current from the battery circuit *r* to fire the magnesium when the capacities *p* and the coherer *n* are in use.

In operation, two charges are placed in position, one in each of the troughs c c^1 and the lid of one of the troughs is closed, leaving the other open and in open circuit with the batteries *k*

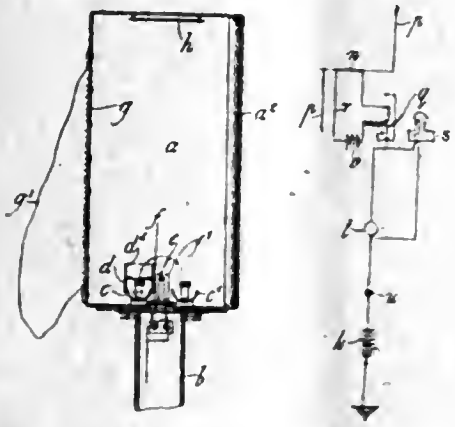


Fig. 2.

Fig. 3.

and the electric fan *j* (fig. 5). Wireless waves are then transmitted and picked up by the capacities *p* and acting on the coherer *n* close the relay *q* and permit the passage of the current and the ignition of the magnesium by means of the fuse wire *s*.

As soon as the fuse wire has burnt out the current then passes through the motor circuit. The excess of gas under pressure generated by the ignition is permitted to escape into the loose bag g^1 through the opening a^1 in the lamp box *a* at the same time serving to close the flap valve *h*. The gas under pressure then also escapes down the hollow telescopic tubular support *b* b^1, initially sets in motion the fan *j* of the electric motor if the current has not already started it, by acting on its blades, and then passes out by way of the perforations *l* and the

Fig. 4.

smoke-proof cloth *m* at the lower end thereof. The motor *t* is then kept in operation for a sufficient length of time to completely exhaust the lamp box *a* of the fumes and smoke and to draw in fresh air by way of the flap valve *h*. When this operation is completed the apparatus is then in order for the firing of the second charge and the operation is repeated if desired.

In order to facilitate the resetting of the fuse wire in the troughs c c^1 the wire *s* may conveniently be secured in transverse or diametral slits provided in the lower ends thereof, which are also chamfered or tapered in planes at right angles to these slits so as to prevent cutting of the wire.

It will be understood that the radio-energy received by the plates or other capacities *p* can be adjusted by means of suitable indications, condensers, amplifying valves, etc., and that the lamp case itself can, if necessary, be used for receiving the energy. As an alternative method one aerial can be erected on each lamp and the return circuit made by means of the coiled metal tape *v* arranged in the lower tubular supporting member and which may also be earthed to the transmitter by the same means.—Bertram Tom Hewson, 5, Oxford Terrace, Hyde Park, London, W.2.

The following complete specifications are open to public inspection before acceptance:—

Colour Photography.—No. 182,814. Photographic apparatus for making photographs in natural colours. H. Diernnofer.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

Kima.—No. 424,732. Scientific instruments included in class 8. W. Watson & Sons, Ltd., 313, High Holborn, London, W.C.1, manufacturing opticians. March 27, 1922.

Oso.—No 424,837. Photographic paper, photographic albums, and photographic mounts, included in class 39. Thomas Illingworth & Co., Ltd., Cumberland Avenue, Park Royal, Willesden Junction, London, N.W.10, manufacturers. March 30, 1922.

MARKS PLACED ON THE REGISTER.

The following marks have been placed on the register:—

Stands Above All (Stork Design).—No. 421,936. Photographic apparatus included in class 8, made in Great Britain. William Butcher & Sons, Ltd., Camera House, Farringdon Avenue, London, E.C.4, manufacturers.

New Books.

Process Engraving. By Edward S. Pilsworth. New York Macmillan's. 2 dollars. 8vo. pp. 168.

The literature on the subject of photo-engraving is by no means so extensive that the appearance of another volume dealing with the subject on general and practical lines would not be welcomed. The present book gives an idea of American practice rather than the methods which are usually adopted in this country.

In an introductory chapter a brief survey of the development of illustration processes is given, which will be of some interest to those who are unfamiliar with this subject.

The chapter on photographic equipment cannot be described, at any rate from an English point of view, as being quite up to date; the drawing that is given of a camera is of an obsolete type, and the drawing of the dark slide shows the old arrangement for supporting the ruled screen in it. Of course, this is not met with in modern studios, and yet no reference is made in the book to the use of screen gears fitted into the body of the camera.

The section referring to half-tone screens is satisfactory so far as the reference to ruled screens is concerned, but with regard to the use of the Metzograph screen it is entirely misleading; it is quite impossible to obtain satisfactory results with this useful irregular grain screen by following methods in acordance with the instructions which are given.

The description of the lens to be used for process operating is not very helpful; it is said the lens should be "reasonably speedy, and it is the safest plan to use a lens which is somewhat larger in size than the camera on which it is to be used." We suggest that a definite reference to the equivalent focal length of the lens for a particular size plate, together with the ratio of the diameter of the largest stop to the local length would have been more helpful.

The author states that the "theory of wet-plate photography, roughly speaking, is that the glass plate is coated with a sensitive collodion," which makes it evident that he is not familiar with the most elementary theory of the process. The strength of the fixing bath given is three ounces of potassium cyanide to twenty ounces of water. Our own experience is that this concentration of potassium cyanide will have a strong solvent effect upon the silver image.

The portions of the book devoted to stripping the negative and to printing and etching the plate are more satisfactory than those devoted to negative making; but in the formulæ we note some statements which would probably lead to disaster in practice. For example, the addition of forty grains of chromic acid to an enamel for working on copper of which the total bulk is eighteen ounces would almost certainly tend to "scummy" prints, although such a formula might work successfully on zinc.

The chapter on mounting and finishing the process blocks is well done, and may be read with interest and practical advantage. The whole of the machinery is described in a satisfactory way,

which will be helpful to engravers and printers alike, especially the section describing the hand finishing and engraving of the etched block.

The reference to high light half tone work confines itself to deep etched blocks; but there is no reference to high-light photo-lithography.

Some sections of this volume are of distinct practical value, and it is to be regretted that the author did not have as a collaborator someone who possessed a more accurate knowledge of the principles upon which photo engraving depends.

Der Aufbau des Photographischen Bildes. By Dr. E. Goldberg 85 pp. Halle: Wilhelm Knapp. Mk. 45.

In this country students of the scientific basis of photography know Dr. Goldberg very well as the inventor of the graduated sensitometric wedge which bears his name and has proved of such great use in sensitometric measurements since its introduction about the year 1911. Moreover, those who visited the Dresden Exhibition of 1909 will remember his score or so of cabinets, each providing a demonstration of one or another of the physical phenomena connected with photography. The visitor was given simple instructions on the outside of each box for the performance of the experiment himself; and the design and construction of the cabinets showed remarkable ingenuity in bringing the facts upon which the processes of photography depend before those unacquainted with them in a most interesting way.

Dr. Goldberg, who since the year 1917 has been director of the research laboratory of the Ica camera works, has for some years past occupied himself with experiments made for the purpose of providing, so to speak, a quantitative basis for the operations concerned in the taking and printing of a photograph. Accepting, as one is bound to do, the dictum of the late Lord Kelvin, namely, that we do not properly understand a process until we are able to express its working by numbers, it is clear that the making of a photograph is a process which is still very far from the state of being capable of numerical calculation from start to finish. Hitherto, endeavours to render it quantitative have centred chiefly round the problem of exposure, directed to this end by the investigations of Hurter and Driffield, Watkins, and many others. Yet there still remain many factors for which provision is not made in even calculating exposure, to say nothing of the development and printing of the negative. A good example of this qualitative condition is the system (if it can be so called) on which allowance is made for the character of the subject in calculating exposure with a meter or by any other means. It is usual to adopt a "standard subject" and to employ a factor according as the subject differs from the standard. Thus, we are told to use a factor of ½ if the subject is "open landscape"; 1-10th if it is "sea and sky"; or 4 if it is "extra dark foreground."

Now the purpose of Dr. Goldberg's book is to outline a system according to which these more or less indefinite descriptions are replaced by figures based on measurement of the phenomena to which they refer. And in point of fact the first chapter appropriately deals with the character of the subject and of the respects in which it is modified by atmospheric conditions. Following Renwick, Loyd Jones, and others, he considers the range of light-intensities in the subject, as seen by the eye and as measured by a photometer, and adopts as the numerical description of a subject the ratio of the highest to the lowest light-intensity, or rather (for convenience in dealing with the subsequent part of the process, namely, the making of the negative and the print) the logarithm of this ratio. The next main portion deals with the reproduction on the ground glass of such a range of light-intensities by lenses of various kinds and under different photographic conditions. Then we come to the recording of this image, in negative form, on the plate, the fundamental quantitative principles of which were laid by Hurter and Driffield, and finally to the making of prints from the negative.

It is scarcely necessary to say that the text book is not a manual of practical photography, and we suppose the mere mention of the word "logarithm" is enough to frighten away even those whose acquaintance with German may incline them to a study of the book. But the merit of Dr. Goldberg's work lies in the comparative simplicity to which he has reduced the theory of tone reproduction in photography. True, he neglects certain factors, for example, the colour of the image on a negative; it is assumed in his pages that the negative is invariably a neutral grey, and in like manner he does not take account of the effect of intensifiers or reducers in modifying the scale of gradation. Nevertheless, a very great deal of photography, since it is done with non-staining developers, may be said to conform to the conditions which he assumes; and thus his symbols do not acquire the forbidding complexity of those put forward by Loyd Jones and others who have elaborated a set of symbols for the theory of tone reproduction. To describe the merits of the book in the fewest words, it tempers the wind of H. and D. to the shorn lamb of the photographic reader. The many illustrations and diagrams, some of them most ingenious, and inserted in the book as actual photographic prints, serve to help the comprehension of the text, which actually requires scarcely any mathematics for its understanding. No other work on the theory of the photographic process has brought the subject within such short compass, has subjected it to such precise and clear treatment, and has taken such pains to show, throughout, the relation of the theory to the operations which a photographer performs in taking his negatives and making his prints.

New Materials.

Narrow Art Mouldings.—Mr. T. W. Forrest, 27, Bower Road, Hackney Wick, London, E.9, sends us some specimens of the very artistic narrow mouldings, which he is manufacturing in gilt, copper, antique, oxidised, pewter and silver surfaces. The mouldings are supplied in the two widths of three-eighths inch and half-inch, and may be had in bead, bevel and flat sections. We have nothing but praise for the extremely artistic appearance of these mouldings, which, hitherto, Mr. Forrest has supplied only in the form of made-up frames. Recent extension of his factory has enabled him to cater for the larger demand represented by the purchase of the mouldings in 100-ft. lengths. The prices range from 24s. to 28s. per 100 feet, and Mr. Forrest offers to send a sample 100 feet of assorted sections and colours, carriage paid to any address for £1. Photographers wishing to make the acquaintance of mouldings, which are admirably adapted for the display of any descriptions of photographs of moderate size, will be well advised to see these attractive styles for themselves by ordering a sample set. It should be added that Mr. Forrest is a manufacturer also of polished wood mouldings, including inlaid,

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Monday, July 31.

Southampton C.C. Competition.

Tuesday, August 1.

Bournemouth Camera Club. Informal Meeting.
Hackney Phot. Soc. "The Negative and the Print." W. Selfe.
Hammersmith Hampshire House P.S. "Notes on Landscape." D. H. Wilkinson.
Manchester Amateur Phot. Soc. "Carbon Printing." H. E. Johnson.

Wednesday, August 2.

Edinburgh Phot. Soc. Outing to Botanic Gardens.
Rochdale A.P.S. Picture Framing Demonstration. F. Greenwood.

Thursday, August 3.

Sheffield P.S. Outing—Whiteley Wood to Ring'low.

Saturday, August 5.

Dennistoun Amateur P.A. Outing to Harbour. (Visit from Wishaw C.C.).
Hammersmith Hampshire House P.S. Outing to Huntingdon (August 5-7).
Rochdale A.P.S. Outing to Reddisher Woods (Bury).
South Glasgow C.C. Outing to Bothwell Castle.

CROYDON CAMERA CLUB.

Mount Terror, after quiescence for over six years, burst into eruption last week, the secretary, Mr. J. M. Sellors, projecting a flow of practical instruction on the art of "Lettering," at which he is an adept. It is a most useful one for many, including secretaries of photographic societies, not only for announcements on

the notice board, but for graph-copied circulars dealing with special matters not included in the regular printed syllabus.

One of the surest ways of putting Mr. Sellors in benign mood for a reasonable period is to allude incidentally to his really remarkable skill in lettering. So every hope was entertained that the evening would pass without any obligation on his part to refer to his audience as "miserable blighters," or "hopeless addlepates," as is his pleasing wont.

In measure the members were spared a critical review of their moral and mental attributes by the diversion of vials of wrath on to an unconscious brass band below, which played with great resonance and hostility between the instruments. It was followed by a cornet solo, with a rendering of the "Lost Chord," which made all wish that every individual note was also missing. Mr. Wadham declined to go outside and suck a lemon, and the nuisance continued.

When lettering, Mr. Sellors said, avoid copying from formal type, and particularly from imitating the style adopted by the professional sign writer. There are many cheap and rather nasty books obtainable, giving various alphabets. Far and away the best text-book is "Lettering," published by Bacon & Co. (the map publishers), of Fleet Street, which contains much instruction, and a large assortment of alphabets. Price now is in the region of five shillings.

Any good paper with smooth, but not glazed surface, is suitable. Inks are various; liquid drawing-inks in many colours can be purchased from artist and engineers' supply shops. The corks are usually fitted with a dipper for filling the pens, which are better not inserted in the bottle. Ordinary writing-inks can be used, but they, like present-day whisky, contain too much water. If this is evaporated they are fairly satisfactory. A good ink is Waterman's "jet-black," as supplied for fountain pens; a cheap substitute, Stephen's "ebony stain," which reproduces well for process work on some papers, however, the latter dries with a gloss.

He then turned to implements, and produced about fifty weird pens of varied size, and a dozen or so distinct breeds. For each colour he reserves one pen, identifying it by staining the end of the handle. It was gently and very politely pointed out to him that talent inferior to his own genius would hardly require such a galaxy of pens, and if he would be kind enough to mention a few which would cover most purposes it would add to the value of the lecture.

Luckily, no offence was taken at this request, and he said that for diagrams Mitchell's "Witch Parcel Pens," supplied by Strakers, at 3d. each, are useful. For medium and large lettering, Boxall's "Automatic Pens," supplied by Reeves & Sons, artists' colourmen, are excellent. They are supplied in three grades—solid, double-line, and shading, at 1s. 3d. to 1s. 6d. each. J. Gillott's pens for ornamental writing are also very serviceable for all round work. They can be obtained from most stationers, eleven assorted on a card for 7d., or in boxes of two dozen of one width.

Among others were "Scribe" (reed) pens, capable of being trimmed like a quill, and sold by Pitman & Sons, Parker Street, Holborn, and the "Beaver" pen, a class by itself, for fine unbroken lines, sold by Stamford (map publishers), of Long Acre.

The various styles of lettering were well illustrated by specimens executed by Mr. Sellors, which were passed round. They were mostly in the nature of homilies addressed to the members of the club, and hardly of complimentary nature. The demonstration concluded with a generous distribution of free samples. Of late, he said, he had been bitterly disappointed at the absence of this feature in so many demonstrations. A most hearty vote of thanks was accorded the lecturer, who throughout the evening had been fully exposed to the poison gas proceeding from the president's Commercial Road Havana.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A meeting of the Council was held at 35, Russell Square, W.C.1, on Friday, July 14, 1922, when there were present: Messrs. Marcus Adams, Angus Basil, Arthur Bennett, Frank Brown, W. B. Chaplin, H. A. L. Chapman, Gordon Chase, Alexander Corbett, C. F. Dickinson, W. E. Gray, Reginald Haines, George Hana, William Illingworth, Herbert Lambert, R. N. Speaight, H. A. St. George, F. G. Wakefield, Halksworth Wheeler, with Mr. Alfred Ellis (secretary) and Mr. Griffiths (Editor of Record); Mr. Alexander Corbett, in the chair.

The Secretary read a letter he had written to a correspondent who had complained that the Council had not adopted a fighting policy in certain particulars. It was agreed that the secretary's letter should be incorporated in the minutes.

Replying to the charge that the Council was not sufficiently alive to the interests of its members, the Secretary said: "With reference to your remarks re the charges for electric current at power rates, I fear you do not realise the magnitude of the undertaking when you suggest that the P.P.A. 'should fight it out in the common interest.'

"The Council have the best possible advice on this subject, and are fully aware of the powers that have been conferred by Acts of Parliament on electric light undertakings. The question is so vital to all electric corporations that nothing less than a House of Lords' decision would satisfy them, and would probably cost some thousands of pounds."

The Secretary reported that the number of members stood at 1,013. The number who had signed the forms up to the present was 724. The number who had paid last year's subscription was 856, and the number who had paid this year's subscription (due July 1) was 273.

The Secretary announced, with regard to the dispute with two papers on taking single portraits out of groups, that the Council of the Press Photographers' Association was taking counsel's opinion.

It was agreed, on the Chairman's suggestion, that the question of charging for prints sent out for Press reproduction purposes should be discussed at a later meeting.

In the matter of a dispute concerning the name of a photographer appearing under certain book illustrations, the firm which had acquired the business of the photographer in question claiming that the name should be that of the firm and not that of the individual, it was agreed that the secretary and Mr. Adams should go into the matter.

Offers of terms by two insurance companies were considered, and the matter was referred to the Finance Committee for decision.

The receipt for the incorporation law costs (£105) was produced, and it was agreed to send the solicitor a letter of thanks from the Council for the manner in which he had conducted the business.

The Congress.

Mr. Wakefield reported that quite a considerable number of stands had been taken since the last meeting of the Council. He agreed to a suggestion that certain firms who had not yet agreed to take space should again be written to at his discretion, and reminded that the closing date was July 20.

Mr. Wakefield submitted proposals for the printing of tickets and for evening arrangements. It was agreed, on the proposition of Mr. Haines, seconded by Mr. Lambert, that the Thursday evening in Congress week should be set aside as the assistants' evening, and a suggestion by Mr. Wakefield was adopted that it should be intimated on the tickets issued for other than members of the Congress, and that the pictures in the Congress room would not be on view any evening after 6 p.m., and that over the entrance to the Congress room the words should be placed "Members Only." Mr. Wakefield was authorised to proceed with the tickets, the exact form being left to his discretion and that of Mr. Corbett as the Exhibition Committee. The number of tickets which might be required was stated to be about 3,000.

The Secretary reported that he had seen the manager of Prince's Galleries with regard to the provision of light refreshments on the assistants' evening. Some discussion took place on the best arrangement, and in the result Mr. Gordon Chase was asked to call his committee together and to decide upon the necessary arrangements for the issue of assistants' tickets, their endorsement by the principals, and the way in which the refreshments should be provided. The motion that the committee have full power to deal with the matter was proposed by Mr. Adams and seconded by Mr. Speaight, and agreed to.

The Secretary reported that he had an offer by a capable journalist who was in touch with the editors of newspapers to circularise items about the Congress during the preceding eight weeks.

Mr. Illingworth moved, and Mr. Adams seconded, that the offer be accepted, and this was agreed to.

A letter was read from a member suggesting a visit to the National Portrait Gallery. The letter was handed over to Mr. Haines, chairman of the Programme Committee.

The Secretary reported that the Kodak Company had sent out forms to the leading Continental photographers for attaching to the prints sent to the exhibition. This action was appreciated.

Mr Haines gave an account of the proposed programme of the Congress. On the Monday morning there would be an informal gathering of members to register; in the afternoon the formal opening, and in the evening the reception of President and Council. On Tuesday morning a visit to some place of interest yet to be finally arranged. On Tuesday afternoon the President's address, and in the evening a lecture. There would be the same programme on Wednesday, with demonstrations and lecture in the afternoon. On Thursday it was proposed to have a special outing, and the evening was the assistants' evening. On Friday it was hoped in the morning to visit some studios, and in the early afternoon the Salon; later to hold the annual general meeting, and at night to have the dinner. On Saturday it was proposed, if possible, to pay a visit to the Royal Photographic Society's exhibition.

Mr. Speaight thought that the President ought to give his address at the beginning of the Congress.

On the proposition of Mr. Frank Brown, it was agreed that Mr. Haines should be empowered to arrange for music.

The cost of programmes was also considered. It was agreed, on the motion of Mr. Illingworth, that 6d. be charged for programmes, including the exhibition catalogue.

Mr. Speaight gave notice that at the earliest possible moment he would call attention to the expenses of the exhibition at a meeting, to be called, of all the various exhibition committees.

Nominations for Annual General Meeting.

Mr. Speaight nominated as President for next year Mr. Alexander Corbett. Mr. Illingworth proposed, Mr. Adams supported, and the resolution was agreed to unanimously and with acclamation.

Mr. Lambert proposed the nomination of Mr. Speaight as treasurer. This was seconded by Mr. Frank Brown, and also agreed to unanimously and with acclamation.

Both Mr. Corbett and Mr. Speaight acknowledged the compliment.

Lots were drawn to decide which members of the Council should retire at the annual general meeting. The names of the members of the Council were placed in a receptacle, and were drawn by the Chairman as under :—

Town.	Country.
Mr. Basil.	Mr. Chaplin.
Mr. Haines.	Mr. Read.
Mr. Hana.	Mr. Spink.
Mr. Lang Sims.	Mr. Wedlake.

The Secretary said that he hoped to submit the draft report of Council to the next meeting.

Railway Rates.

Mr. Gray described some correspondence he had had with the Great Western Railway Company relating to luggage carried by photographers, following upon an occasion on which he was charged excess luggage for his photographic equipment. He had been informed that every month the different railway companies had a joint meeting to decide matters which affected them all, and that at one of these meetings, by a very small majority, it was decided that photographers should pay for their luggage. But the contrary view was so strong that the matter was raised again the following month, with the result which appeared in a letter he had received, dated July 5, from the superintendent of the line at Paddington, who wrote:—"Adverting to our previous communications and my representative's interview with you, the railway companies now agree to photographic apparatus accompanying passengers travelling for the purpose of taking views for a firm of photographers being conveyed free up to the weights allowed to ordinary passengers, and I have pleasure in enclosing a postal order for 7s., receipt for which kindly acknowledge on the attached card.—Yours faithfully (sd.) R. H. Nicholls."

Mr. Gray said that the effect of this was that they could now carry luggage up to 100 lbs.

The Chairman said that this was a very valuable concession, and that the Association was very much indebted to Mr. Gray.

The Chairman said that he was more than surprised and pleased at the first issue of the Record, and he moved a vote of thanks to Mr. Hana, Mr. Adams, and Mr. Griffith, the editor, and all who had served on the committee.

Mr. Lambert seconded, and said that the committee was to be congratulated on the way in which it had got over the difficulties.

The vote of thanks was accorded unanimously, and Mr. Hana and Mr. Adams briefly acknowledged the compliment, and asked for further suggestions for succeeding numbers.

The Secretary read a large number of letters from members asking for advice or information in certain circumstances; also his replies. The various matters dealt with included negatives broken in post, copyright infringement, advertisements, Sunday trading, rate of wages for assistants, the liquidation of a photographic dealer, a refusal to pay the new scale of Press fees, views taken for a local paper, the assessment of a studio, the photographing of a public school, a complaint against a newspaper for taking estate photographs at a low rate (a matter on which the secretary was instructed to write to the journal concerned), commercial prices, copyright reproduction, the purchase of a business, and various other matters.

The secretary's replies were in all cases approved, and at the close Mr. Adams and the Chairman complimented the secretary upon the precise and painstaking way in which he had dealt with all these inquiries, which formed a good indication of the "appeal work" of the Association. It was also suggested that a synopsis of the cases should appear in the Record.

The names of Miss Barrett, Mr. A. Higginbotham, Mr. Hanson, Mr. R. Harding, Mr. C. F. Usher, and Mrs. E. Cross were submitted as members, having been duly recommended, and their adoption was proposed by Mr. Illingworth, seconded by Mr. Adams, and agreed to.

Certain deaths of members were reported, including that of Mr. Miles, of Miles & Kaye, and the secretary was asked to convey the regret of the Council.

A few resignations were submitted, and in some cases the reasons were given. In one or two instances the secretary had succeeded in getting the member concerned to reconsider the matter.

Mr. Hana reported that the results of the questionnaire dealing with prices of commercial work would be tabulated immediately, and he asked for permission that they might be published in the Record, but without names. This was granted.

This concluded the business of the Council, which had occupied more than four hours.

News and Notes.

Burglars Defeat the Camera.—In a burglary at Matlock last week a police photographer found that the burglars had wiped whitening over the places where finger-prints should have been visible, in order to prevent photographs being taken.

A Job for Lady Photographers?—Most of last Sunday's newspapers published the following paragraph:—"Mrs. Helen Sibthorp, of Hornchurch, Essex, aged 100, has never had her photograph taken, and has a strong objection to camera men coming near her."

Beach Photographers' Losses.—The inclement weather experienced at most seaside resorts during the past seven or eight weeks has played havoc with many beach businesses. According to one daily paper many of the beach operators are taking £50 per week less than they took during the phenomenal weather last year, when only one small shower was experienced between May and September.

Photographic Exhibition at Geneva.—The "Board of Trade Journal" states that a photographic exhibition will be held at Geneva, in May, 1923, one section of which will be devoted to an international display of all photographic apparatus and allied products. A limited number of copies of the general regulations is available on application to the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1.

Photographs for Reproduction.—The attention of the Professional Photographers' Association has been called to the action of newspaper editors in asking for a supply of portraits of celebrities for filing purposes. Members are advised not to supply them, unless the editor agrees to pay 1s. for each photograph at

the time of delivery, and that this amount is to be over and above the fee payable when the photograph is reproduced.

A Kodak Condensed Price List.—A list of the prices only (without illustrations or descriptive particulars) of the many requisites made and supplied by them has just been issued by the Kodak Co., and is obtainable free on application to Kodak House, Kingsway, London, W.C.2. In this condensed form the list runs to 72 pages. It is provided with an excellent index, and contains a reference, opposite every article, to the firm's 1921 descriptive catalogue, in which full particulars of the goods may be found.

P. P. A. Congress.—For the purpose of assisting members and friends attending the Congress, the secretary of the P.P.A. has arranged with Messrs. Cook & Son, to reserve any hotel accommodation which may be required. Members wishing to avail themselves of these facilities should send a deposit of one pound to Messrs. Thos. Cook & Son, Ludgate Circus, London, E.C.4, when the desired rooms will be reserved. A receipt will be issued for the amount in question, and this will be accepted in part payment of the hotel bill. Intending members of the Congress are reminded of the importance of making their hotel arrangements at the earliest possible moment.

T.E.B. Mounts and Albums.—Messrs. W. Butcher and Sons, Ltd., Camera House, Farringdon Avenue, London, E.C.4, have just issued a profusely illustrated catalogue of 84 pages describing the many styles of mounts and albums manufactured by them. Folder mounts in considerable variety figure in these pages and include some most attractive new styles. Single mounts and many types of slip-in mount for the amateur are also listed and illustrated, in addition to a great variety of albums and other accessories, such as transparent envelopes, passe-partout materials, and wallets for D. and P. The list is published for the use of dealers and professional photographers, and is sent on receipt of trade card.

Windmill Pictures for Londoners. — Windmills have always been favourite subjects among view-taking photographers (writes a correspondent), and habitués of exhibitions will recall many notable pictorial masterpieces of mills by J. M. Whitehead, Hawksworth Wheeler and others. One does not associate London with windmills, although one once stood in the Strand and two upon Blackheath—the latter being remembered by some persons still living. The "Evening News" of the 18th inst., however, contained a special article, with photographs, on "London's Circle of Windmills," drawing attention to the pictorial possibilities and present state of windmills within easy 'bus rides of London. The eight examples illustrated were those at Arkley, Wimbledon, Upminster, Shirley, Coulsdon, Coleshill, Keston and Horndon.

Camera Outings in Australia.—The Australian amateurs are, it appears, more keen on winter-time outings than are the members of photographic societies of our own country. The current issue of an Australian photographic journal (writes a correspondent) gives an account of an outing of the Photographic Society of New South Wales, on May 6 last, when there was a good attendance and over 70 exposures made. The same publication also gives an account of an outing by the members of the Adelaide Camera Club, on April 15, and these are by no means isolated events. April and May are not the best of Australia's photographic months, but the amateurs are too keen to give up outings during their dull season. The average number of hours of sunshine at Adelaide during April is 176, but in Sydney during May the number is only 111, and the numbers of "clear days" are 3·8 and 2·9 respectively.

Legal Photographs.—In the "Motor" of July 18 last is an article which well illustrates the value of photography as an accessory to legal proceedings. It concerns a motor accident which occurred last October at Rochampton, and in which four cars were involved. One of them was being driven by Mr. G. W. Lymbery, of the Photopress Agency, 3, Johnson's Court, Fleet Street, and the plaintiff in the action. At a cross roads a Talbot car collided with a Dodge car at the moment when Mr. Lymbery was passing in his Swift, with the result that the Talbot crashed into his car, the road was blocked in an instant and thus further damage to the Swift was done by a Ford which was travelling just behind it and was unable to pull up in time. Although violently shaken by the collision, Mr. Lymbery, who had a Press camera with him, was able after a time to take a series of five photographs of the accident before the cars were moved. These proved of great value in court, and no doubt were largely instrumental in obtaining judgment in Mr. Lymbery's favour for £120, with costs, against the owner of the Talbot.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

FILM EATING INSECTS.

To the Editors.

Gentlemen,—Most photographers, I believe, are very well aware of the damage the common or garden earwigs and the kitchen cockroach can do to a drying negative, but at the present time there appears to be in many of the London suburbs—and maybe in the provinces as well—a plague of a peculiar kind of beetle known in polite circles as a "Silver Fish," though many venture to give it names not to be found in any book on natural history. These little fellows, who inhabit sinks and damp rooms, will play havoc with damp negatives, for they have a well developed taste for photographic emulsion on plates, films and papers, commencing their meals at the outer edges and working inwards to the centre. The damage done to several negatives drying in a rack was put down to earwigs, until I discovered the real offenders at work. Not being fond of daylight the silvery visitors are not easy to entrap, and maybe some of your readers, now that the plague is about, have met with damaged negatives and prints, and have been unable to trace the cause.

The culprits are about half-an-inch long, rather like a miniature whiting on short legs, smooth to the touch, being covered with a sort of white silvery coat. Possibly some of your readers have found an infallible remedy for them; all I can do is to beware of them and destroy them when seen.

I have heard of these insects attacking dry and even old negatives, and of them finding their way into boxes in which negatives are stored, and there attacking the gelatine. My own experience, however, is limited—for the time being, at any rate—to damp or half-dried negatives.—Yours faithfully, Near East.

SYSTEM IN HALF-TONE OPERATING.

To the Editors.

Gentlemen,—I would like to welcome Mr. Bierman's article in the "British Journal of Photography," of July 14, on "System in Half-tone Operating," because I am only too keenly aware how much has yet to be done before we are in possession of complete knowledge of the half-tone method such as will enable factory operations to be carried on with that precision which is done in so many other branches of technical work.

He states that there is a difference in the result when working with coarse or fine screens, and then attempts to show the reason for this difference. This variation with the fineness of the ruling I do not now propose to discuss. I am interested to learn that Mr. Bierman has, in the course of long experience, found this difference to exist; in fact, I suppose most people who have worked with a variety of screen rulings have noticed differences, but exactly what the difference is requires further careful work carried out in such a manner that quantitative results can be established.

I must, however, express some doubt as to Mr. Bierman's explanation of the cause of the difference being the diffraction pattern produced when the image of the stop is photographed. The resolution in the image which is formed by any lens is dependent upon the size and form of the aperture. This fact is often lost sight of in photographic work, but becomes of great importance in astronomy, for the shape of the images of stars is dependent, for the most part, upon the aperture of the telescope objective, the diffraction pattern being larger than the true image of the star would be, and when the aperture is divided into a number of small, regular apertures, the diffraction pattern becomes very pronounced. Now I suggest that Mr. Bierman's haloes are diffraction images or patterns formed on the retina of the eye, or the photographic plate of the camera used for photographing the effect, by the apertures of the half tone screen that happen to be sending light into the lens in question. The complete pattern formed is a somewhat complicated one. It consists of four series of overlapping images of increasing order formed at right-angles to each other, and so giving the effect of a cross of light. In between

the arms of this cross are secondary images which are not often seen, and as the intensity of all these images diminishes from the central image outwards, so when they are photographed, especially with a "hard" working plate and developer, there is a tendency to lose the faint ones, and thus the lens aperture when photographed in this way might appear to be enlarged; but it must be remembered that this image is formed at the focus of the camera lens, and that there is no enlargement of the aperture of the process camera, either real or virtual. The question I should therefore like to ask is, how does this diffraction image affect what happens in the plane where the half-tone dot is formed?

There is, of course, another diffraction pattern formed whenever the aperture of the process camera lens is small, but this is formed close behind the screen ruling, and its effect, if any, would be merely to break up the half-tone dot.—Yours faithfully,

A. J. BULL.

L.C.C. School of Photo-Engraving,
6, Bolt Court, Fleet Street, E.C.
July 18.

MONOCHROME OR COLOUR IN PICTORIAL PHOTOGRAPHY.

To the Editors.

Gentlemen,—I feel sure that I express the feeling of the great majority of those who make or take photographs, including some of the recognised top-notch experts, that they would, if they could, prefer to make their pictures as they appear in nature with their real colours. There are some also, among the experts, who say that they prefer pictures in black and white. I suppose the question of individual taste and temperament enters largely into the preference, although I feel sure that the difficulties, the patience and skill required in mastering colour methods, are responsible for preventing as many from producing pleasing results as would be the case if the methods of working could be made simpler. In some cases the suitability of environment in displaying a picture to the best advantage applies as much to a photograph as to a painting, and there are occasions and places in which a good black-and-white photograph is undoubtedly preferable to any picture in colours, just as is the case with a good engraving or etching in black and white. My contention is that, on looking at the general effect of even the best exhibition of photographs, or selecting them individually, one cannot help feeling that so much of the charm and reality of the subject is missing through the absence of the real colours of the picture. I think there can be no doubt that if, when the science of photography was first introduced, it had been possible to make pictures in their natural colours as seen on the focussing screen, as easily as in black and white, there would have been few black-and-white photographs. If the subjects chosen for photography were limited to wet, dull days, winter scenes, night scenes, mists and fogs, and portraits of Kaffirs and Hindoos, in which there is little colour, well and good, but to suggest that the glorious shades of green of the foliage of trees or the healthy complexion of a charming Anglo-Saxon girl, for instance, are as pleasing when represented in black and white as in the colours which nature provides—well, all I can say is that I am sorry for those who are content to see things thus, and I am thankful for the gift of the power to see things not only beautiful in composition, form, tone, balance, perspective, and all the qualities of which a good black-and-white picture consists, but, in addition to these, perhaps the most valuable quality of colour, without which most pictures are lifeless.

There are still many people who do not know that it is possible to make photographs on paper in natural colours, and have never seen any, and there are also many, no doubt, who have struggled with all sorts of problems and difficulties in the hope of producing more direct colour photography, and have arrived at a certain degree of excellence, which is in most cases not quite good enough. What is needed is continual perseverance, an intelligent appreciation of the requirements, absolute exactness of manipulation, and good judgment. Amongst those who have been wonderfully successful in this work, and who have exhibited some beautiful pictures in many of the exhibitions in different towns, Mr. S. Manners stands out pre-eminently. He has been so successful with his methods of producing photographs in natural colours on paper that there is much demand for information of his methods, and he is kept very busy supplying the necessary information and materials with which he produces these beautiful pictures at the Raydex Photo Co. Works, 71, Lavender Hill, London. I believe he intends to submit some very fine examples of this photography for the forthcoming exhibition at the Royal Photographic Society in September, when those who do not know the possibilities of colour photography will have an opportunity to see them, and I feel sure that with the improvements which Mr. Manners has worked out in the different stages, and materials used in the process, many who see the results will not be satisfied until they can improve on their black-and-white photographs by making many of the subjects in natural colours.

Mr. Manners deserves full credit for his patient, painstaking efforts as a pioneer in producing all the requisite materials and giving the necessary instruction to carry the work out, and to those who know something of the difficulties with which he has had to contend, and the handicap of appliances and conditions under which he has done this work, the results are simply wonderful; but that is frequently the way in which some of the best things are produced.

I have written this, not with any intention of advertising Mr. Manners's Raydex process—much as he deserves it, and worthy as it is of all the advertising possible—but to try and get the opinion of good authorities in photography on the subject in the condensed form of a letter which will be instructive.—Faithfully yours,

LOUIS H. JOHNSON.

38, Heathhurst Road, Hampstead.
July 24.

THE PRESERVATION OF NEGATIVES.

To the Editors.

Gentlemen,—A few days ago I went through some boxes of negatives that had lain untouched for about twenty years, when I made a few discoveries which may interest your readers, and from which a few lessons may perhaps be learned.

It is a matter of opinion as to what is the very best method of storing negatives, some preferring one system and some another. Many years ago I was employed in the workshops of one of the largest firms of view publishers on the Continent, where I for a time had charge of their immense stock of negatives—negatives dating from the wet-plate days, with, of course, dry-plate negatives from the date of their coming in. All the negatives were varnished and stored in grooved boxes, and all were in a perfect state of preservation. Stored in this way, they took up an enormous amount of room, and were stocked in quite large warehouses. It was certainly an excellent system, but few of us can spare the room to store negatives in this way.

I was never able to get the formula for the varnish used, and I have never met with anything quite like it since. It was as white and as liquid as water, had the smell of benzine, was rather sticky, but dried very quickly and very hard.

In my own business it has been my habit to store negatives in the original plate boxes, and this is the plan adopted, I believe, by the average worker to-day, sometimes with plain white paper between the plates and sometimes without. I gave up varnishing every negative many years ago, and to-day I varnish only those I consider valuable. In cases of very valuable negatives, however, I invariably make transparencies from them, in case of accidents. But to return to an analysis of my old stock.

The varnished negatives had kept splendidly, but around the edges of the unvarnished ones were nasty discolorations. The most curious fact, and one I wish to emphasise, is that all negatives that happened to have been laid film side upwards and at the top, *i.e.*, exposed to the air, were very spotty and badly faded. They were, of course, covered by the lids of the boxes, but not being airtight, air gained access to them. The negatives were stored on the top of shelves in a room in which the air has not been of the purest, gas has been burned in large quantities, while the tobacco smoke that has ascended to those boxes has been too terrible for words. The negatives stored at the tops of the boxes, but film side downwards, did not show the spots and fading that the film-upwards negatives showed. Therefore a lesson to be learned in cases where negatives are stored in plate boxes is to place the top one film side downwards.

A few of the negatives were in paper bags, and the appearance of these after their twenty years' rest teaches a lesson. A negative stored with its film side facing the front of the bag is in a good state of preservation, but those negatives that happened to be housed with the glass side touching the front of the bag, and the film side on the side of the pasted seam and loose flap of the bag, are badly marked, especially those which have been intensified.

As an interesting experiment, give someone a negative and an empty negative bag, and ask that the negative be placed carefully

inside the bag. Ninety-nine times out of every hundred the worker will place the film side touching the seam and flap—which is the wrong way if negatives are to be kept bagged for years. One invariably holds an empty envelope flap side upwards, also a negative film side upwards, and when placing the latter inside the former, one never—or very rarely—thinks of reversing one or the other so as to bring the seam and flap in contact with the plain glass. It appears a small and insignificant point, but it is really an important one.

I notice that one of the Continental technical journals advises placing between each pair of negatives (and touching the films) a piece of white paper which has previously been soaked in a 5 per cent. solution of potassium bichromate, dried, and exposed to daylight. The action of the prepared paper is not explained, but it is stated that it is an advantage for preserving in contact negatives that have been developed by different methods. It would be interesting to know more about this method of storage.—Yours faithfully,

ELLIS D. SHORTT.

SOFT-FOCUS LENSES.

To the Editors.

Gentlemen,—In the "Paris Notes" of your current issue, I note with interest M. Clerc's remarks with reference to uncorrected lenses, and as this question has not yet received the amount of attention that it deserves in this country, perhaps I may be permitted to extend it a little.

I do not think that it is generally realised by my professional brethren the great advantages that may be obtained by the use of the simplest optical equipment on their studio cameras. As an instance, I may mention that for years my favourite lens has been a simple plano-convex lens, which I obtained from Messrs. Sharland at the cost of 2s. 6d! It would have been considerably cheaper than this, but I paid double for the privilege of selecting one free from coma.

This lens for a considerable time resided at the inferior end of a tin which originally provided a home for fifty cigarettes, but recently I have had it provided with a mount more in accordance with its increasing importance. It is of 22 in. focus, and 2½ in. in diameter, giving an aperture of something like *f*/8.5. This, I find, is quite ideal for head and shoulders on a 12 x 10, the result being approximately sharp, yet having a delightfully soft character impossible to get by other means.

Unfortunately the whole movement in the direction of these "naturalistic" lenses is under a cloud owing to the vile excesses of certain misguided American workers, who, by pushing things to extremes have covered it with ridicule, so much so that in many cases it is a matter of conjecture as to what the subject may be. Obviously, by increasing the aperture of these simple lenses one can make the rendering of the subject so fuzzy that it merely disappears in fog. Personally, I think that any aperture larger than *f*/7 is inadvisable. The true use of lenses of this type should be merely to destroy small irritating details and so to eliminate retouching and until this view is generally accepted a real movement for good must remain in abeyance.

In my own experience I never found any difficulty in focussing. On examining the image on the focussing screen through a magnifier, it will be noticed that as the screen is racked to and fro, the image of a sharp, high-light (that on the eye is generally the best) will pass through the usual spectral range from red to blue, and the correct position for the screen is that when the blue image tends to become fuzzy nearing the lens. This is, of course, when working with the usual blue-sensitive plate. When working with panchromatic plates and a filter, then the focus is adjusted in a similar manner to the colour of the filter in use, but it should be pointed out that in such a case the image is much more fuzzy, as all of the aberrant colours are recorded.

Quartz lenses also have a great charm peculiarly their own. They give a peculiar ethereal quality which cannot be obtained with a glass lens, but they have faults which are not shared by glass. As the main effect is gained by passing the ultra-violet rays the colour rendering is bad, and the curvature of the field is much more severe. On the other hand, as the chromatic aberrations are not so excessive, they may be focussed more easily—the sharpest visual will do quite well. If a lens of this type is obtained, it should be a crossed bi-convex of the usual formula (with the two radii in the ratio of 1 : 6) and used with the flatter of the curves towards the sitter.

If I may presume to offer advice to would-be experimenters with this class of lenses, I would say, first make the focal length of the lens as long as possible, preferably double the diagonal of the plate in use, and, secondly, keep the aperture low, and not to exceed *f*/7, which in these days of ultra-fast plates is quite usable. Also keep away from full lengths.

Some two years or so ago, I spoke on these matters at the Royal Photographic Society, since when I have been inundated with letters from all parts of the world, so, perhaps, you will permit me to state that Messrs. Sharland, of Thavies Inn, Holborn, will supply lenses of any type in any possible size either in glass or quartz. I have always found them most courteous and obliging, and always ready to do their best for a customer.—Yours faithfully.

ARTHUR C. BANFIELD.

The Saint James Studio, 49, Old Bond Street, W.1.

July 24.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

C. C.—It is rather a tricky business to uncement a lens, which, apparently, is what your lens requires. It is far better to send it to an optician to be re-cemented. The Premier Optical Co., 63, Bolton Road, Stratford, London, E.15, is a good firm for doing jobs of this kind, and probably would charge you only a few shillings.

J. L.—Some of the rolled plate has a slight greenish tinge, which is not enough to affect the exposure, but we have not found that, even after many years' exposure, it turned yellow. You will be quite safe in selecting this glass, but naturally you will choose a sample which is as nearly colourless as possible. There is considerable difference between various makes in this respect.

G. M.—(1) Some glasses are liable to the surface tarnish which yours seems to be suffering from, a defect which is aggravated by storage under conditions of damp. We strongly advise you against doing anything to the lens except gently rubbing it over with a very soft piece of cambric moistened with pure spirits of wine. If this does not clear away the stain, you should send the lens to the maker.

W. H.—(1) We imagine from what you tell us that the lens is a Goerz double anastigmat, formerly sold as the "Dagor," of 7 inches focal length. (2) Messrs. Goerz used formerly a system of marking diaphragms different from the ordinary F. numbers. The F numbers equivalent to those which you quote are as follows:—4.8, *f*/6.8; 6, *f*/7.7; 12, *f*/11; 24, *f*/15.5; 48, *f*/22; 90, about *f*/30; 192, *f*/45; 384, *f*/62.

T. S. MANLEY.—We do not know about putting in clouds with an air brush, since many negatives would not allow of this being readily done, but any expert retoucher would easily work in clouds with a combination of pencil and knife work. Write to Mr. T. S. Bruce, 4 Villas-on Heath, Vale, Hampstead, London, N.W.3, asking for a price per negative, and, at the same time, send him a fair sample of your negatives.

E. B.—You can procure plaster busts in any size and in many styles from Messrs. D. Brucciana & Co., 254, Goswell Road, London, E.C.1. You will find "Gibson's Venus" a good model, as the head is naturally posed, not inclined up or down or twisted on the shoulders. The 100-watt lamp will answer for a spot light if you fit it in a suitable reflector, like a motor lamp, or use a condenser. If you want more of a flood of light behind the sitter's head we think 250 watts will not be too much.

M. F.—Cerium peroxide is an insoluble substance, and, therefore, is not a reducer of the silver image. The substance which is used as a reducer is cerium sulphate, which certainly can be made by dissolving cerium peroxide in sulphuric acid. We don't suppose that you want to go to the trouble of preparing the cerium

sulphate, and, in fact, would not recommend you to do so. Much better to buy the stock cerium sulphate solution, made by Lumière, from their agent, Mr. T. K. Grant, 89, Great Russell Street, W.C.1, from whom are obtainable instructions for the use of the reducer.

R. P.—Unfortunately you do not mention the size of camera. If, as we expect, it is half plate size, by far the better choice is a camera of the Anschutz type. This type is far more generally used by sports photographers than the reflex on account of its greater portability and handiness. Moreover, for photographing char-a-bancs, where very often you require to have the camera at the highest level convenient, the reflex is a rather awkward instrument on account of the higher position you have to take to look down the hood. Neither type of camera is suitable for regular studio portraiture.

H. C.—The following is the borax formula which was referred to. It is the one recommended by Wellington and Ward, both for negatives and prints:—

Metol	20 grains.	1 gramme.
Hydroquinone	20 ,,	1 ,,
Sodium sulphite (cryst)	200 ,,	10 grammes.
Borax (powdered)	200 ,,	10 ,,
Water (hot)	20 ounces.	500 c.c.s.

Dissolve in the order given, allowing each chemical to be in complete solution before adding the next. This developer keeps almost indefinitely in well-stoppered bottles.

L. Joy Boon.—(1) We can only assume that the bath was too much exhausted or imperfectly made up. Another cause would be staleness of the paper before printing. (2) The blue tint on sepia toned bromide prints is due to the presence of iron somewhere in the process, either in the water used for washing, or sometimes in the alum used for hardening the prints before toning. (3) Fixing for an hour will not do the prints any good, but if it does not reduce the depth of the image, it should not be doing them any harm. But it is quite useless to fix for such a long time. Much better to fix in two baths in succession, giving the prints ten minutes in each. (4 and 5) Impossible to say. (6) The markings on the oval print are evidently due to the actual eating of the gelatine by insects. This form of destruction is fairly common in this country, and we daresay much more so in India.

I. F.—We are afraid we cannot help you to find the photographs that you are seeking, for that we think you should inquire of one of the fishing journals; for example, the "Fishing Gazette," published by the Fishing Gazette, Ltd., 19, Adam Street, Strand, W.C.2., but we can tell you as regards copyright. The fee usually paid for reproduction of a photograph in a single issue of a journal is 10s. 6d. Therefore, if you can obtain the name and address of anyone who has the photographs you require, you should tell them that you would like to get a few prints and that you will pass on to the photographer the copyright fee for the reproduction of each which is paid to you by the publishers of your article. Some journals, of course, will not pay a copyright fee for each separate photograph, but will pay for the article and illustrations in a lump amount. Therefore, you must not commit yourself in promising copyright fees which you are not certain of obtaining.

A. H.—It would seem that the dark appearance in the photograph of the silver is due to the reflection of surrounding objects in the bright silver surface at the time the photograph was taken. To avoid this defect, which is particularly marked in the pedestal of the cup and in parts of the round plate, the best plan is to arrange the articles in a species of tent or tunnel consisting of a framework covered with thin muslin. The articles are arranged at the back of this "tent," and the camera placed with the lens pointing into the open front. In this way the only object which can be reflected by the articles is the white fabric of the "tent," and in this way a very much better rendering of the silver is obtained. The tent can be used in an ordinary studio, setting it up so that it gets a strong light, or it can be arranged with a few half-watt lamps just outside it. It need not be appreciably larger than is required for the arrangement of the articles to be photographed.

J. T.—It is a clear case of deliberate infringement of your copyright, and the people who have done it must, as you say, be completely ignorant of the subject of copyright, otherwise they would know that there is no escape for them. The only ground upon which an infringer can plead innocence in an action for infringement is that he did not know and had no reasonable ground for supposing that there was any copyright in the work which he had copied. It is extremely rarely that that plea can be put forward; and in the case of photographs every publisher knows, or ought to know, that copyright is created by the taking of the photograph and lasts for 50 years from the making of the negative. The Copyright Act authorises anyone in your position to take action for the delivery of all copies of the infringing publication, together with the plates, etc., from which the photographs have been printed. Action can also be taken in respect to damages, which in your case appear to have been substantial. We advise you to point out these facts to the publishers, and ask them what they propose doing in the matter. Do not name any sum which will satisfy you. Leave them to make an offer, and if they do not make a satisfactory one promptly the best thing you can do is to cause a solicitor's letter to be written to them pointing out that it will be necessary to take action against them in the County Court failing a satisfactory settlement.

Copyright in Group Photograph.—In May last I asked permission of the president of a local club to photograph the team. The president was photographed in the group with the boys and afterwards paid for and presented each boy with a copy of the photograph. A fortnight ago, a local shoemaker who occasionally takes photographs as a professional obtained a copy of the photograph and made an enlarged photograph, towards the cost of which each boy contributed a small sum. This enlarged photograph, when framed, was presented by a member of the committee to the president on behalf of the boys. Is this an infringement of copyright, or is the shoemaker justified in his action?—N. E.

If it is perfectly clear that you went to the president of the club and said to him, "I will take a group, and it is all the same to me whether you buy copies or not; you need not buy them unless you like," then, without any question at all, the copyright is yours and the shoemaker has infringed it. On the other hand, supposing the circumstances were something like this, namely, that you canvassed the president for an order and that there was an understanding, either expressed or implied, when you photographed the group, that you were doing so because you were going to supply copies to him at so much each, then (although the circumstances are not quite as clear as they might be) we think that the president might be said to have given you an order in response to your request. In this case the copyright is his. The shoemaker has still infringed the copyright, unless he has made his copy with the permission of the president, but any ground for action in this case rests with the president and not with you. In either case the owner of the infringed copyright can, if he wishes, take action against the infringer in the County Court for delivery of all the infringing copies and the negative from which they were made.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. PRICE FOURPENCE.

TERMS OF SUBSCRIPTION POST FREE.

United Kingdom or Canada.—*One Year*, £1 1s. 8d.; *Six Months*, 10s. 10d.; *Three Months*, 5s. 5d.

Any Other Part of the World.	*One Year*	£1 3s. 10d.
	Six Months ...	12s. 0d.
	Three Months	6s. 0d.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibits the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

Henry Greenwood & Co., Ltd., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3248. Vol. LXIX. FRIDAY, AUGUST 4, 1922. Price Fourpence.

Contents.

SUMMARY.

The first of a series of papers, entitled "With a Portraitist in the Studio," appears on (P. 459). These articles are written by a practical worker of unique experience whose aim is to give to the studio worker the kind of help he would get from an experienced portraitist by his side at the time of operating.

Grain structure versus light quanta in the theory of development is dealt with by Mr. W. Clark, B.Sc., in a communication from the British Photographic Research Association Laboratory. (P. 462.)

While it is not recommended that the unskilled should take the responsibility of restoring a tarnished Daguerreotype, the process is one which can be easily carried out after a little experience. We deal with the practical details in a leading article on (P. 458).

In considering the purchase of a reflex, the photographer may form too high opinion of its capabilities in some respects. On the other hand, he may overlook the preventives of common errors in the use of a hand camera which it automatically affords. (P. 457.)

For avoiding reflections in the copying of coins and other small articles of metal, several methods can be used for temporarily dulling the metal surface. (P. 458.)

While the addition of ammonium chloride to the hypo bath renders fixing much more rapid, it is doubtful if a bath of this kind has any practical advantage except for exceptionally "rush" negative-making. (P. 457.)

Messrs. Wellington and Ward, Ltd., have acquired the business of the Leto Photo. Materials Company. (P. 467.)

Tidiness in trimming a large number of small prints, and a handy accessory into which the different sizes of prints may be sorted as they are trimmed, are dealt with in an illustrated paragraph under "Assistants' Notes." (P. 464.)

The Derby Photographic Society, which has been derelict for some years past, has been revived. (P. 467.)

A machine for drying blue-print paper, and a new pattern of ferrotype camera, are described in recent patent specifications. (P. 465.)

Two correspondents write with reference to Continental negative varnishes, giving formulæ in which benzene is used. (P. 468.)

"COLOUR PHOTOGRAPHY" SUPPLEMENT.

An ingenious process has been patented for the conversion of a colour screen-plate transparency into a three-colour print by chemical treatment of the special mixtures of dyes used for the colour elements in the mosaic screen-plate filter. (P. 29.)

Many interesting historical and technical details concerning the once popular Kinemacolour colour process of cinematography are given in a contributed article on (P. 30).

A new arrangement for showing the formation of white light by a mixture of red, green, and blue-violet, and also of all the colours of the spectrum, is described on (P. 32).

EX CATHEDRA.

Extra-Rapid Fixing. When we hear, as we occasionally do, of fixing baths which are claimed to be extraordinarily more rapid in action than those of hypo, we suspect a mixture of hypo and ammonium chloride, which combination was patented years ago by a German chemical firm and placed on the market. The mixture, when first taken into use, certainly does fix more rapidly than hypo, and on that account has its value for the making of negatives in the minimum of time. Yet it cannot be said that in regular use it presents any advantages over a fairly strong hypo solution, *e.g.*, one containing 6 ozs. of hypo in 20 ozs. of water. Indeed, MM. Lumières in their experiments came to the conclusion that in the stage of partial exhaustion the mixture was less efficient as a fixer than a plain solution of hypo of corresponding strength. Nevertheless, for rush work the mixed fixer of hypo and ammonium chloride can render a useful service, and those having occasion to use it for such purposes cannot do better than employ the formula which the late Mr. Welborne Piper found to be the most rapid in action, viz., hypo, 4 ozs.; ammonium chloride, ½ to 1 oz.; water, 20 ozs. This bath fixes in about half the time required by one of the same strength in hypo, and is, we think, as rapid a fixing solution as can be made.

* * *

Why a Reflex? The hand-camera user who contemplates the purchase of a reflex naturally sums up in his own mind the advantages which he will obtain in return for a sum of money which, at the least, is not small. In doing so, he may form too rosy an opinion in some respects, yet one which does not do sufficient justice to the reflex in others. In regard to the facility and certainty of composing and focussing the picture on the ground glass there can be no doubt; the reflex stands alone in providing the means of sharp focus at a large aperture, even with a long focus lens, and likewise of making as sure of the boundaries of the picture when the front is raised as when it is central. Nevertheless, the would-be purchaser may be misled into supposing that it is practicable to keep a rapidly-approaching subject in focus on the ground glass by operating the focussing pinion. It may sound feasible, but practice shows that a pre-chosen spot must be focussed on and the shutter released when the subject reaches it. On the other hand, there are, perhaps, certain minor merits of the reflex which are apt to be overlooked. One of these is the safeguard against misfires (the shutter unset) which it provides. Habit being what it is, it is pretty certain that if the mirror is in the down position, so that the picture is visible in the hood, the shutter has also been set, and hence one is prevented from missing a subject through omission to set the shutter, as may sometimes happen with an ordinary hand-camera. This feature, it must be mentioned, is possessed only by the reflex with

spring-raised mirror, requiring to be put down after each exposure, a type of reflector camera which, for other reasons also, is superior to one in which the mirror falls of itself after each exposure. The quickness of dealing with a subject is another point in favour of a reflex. Another, is the realistic image which is seen; and still another, so some users have assured us, is the guide to exposure afforded by the brightness of the picture. In our judgment and experience, however, there is little to be said for the last-named.

* * *

Copying Medals. In overcoming the reflections which are a source of difficulty in the photography of coins, medals, and similar small articles of metal, the photographer having an air-brush at disposal will spray these originals with a thin film of grey colour. Those, however, who have not an air-brush may obtain as perfect a result by adopting the plan, which we believe was first suggested by Mr. Harold Hood, of depositing a fine coating of magnesium oxide on the articles by burning magnesium ribbon a few inches below the surface of the medal, held in an inverted position. For then holding the coated medal in position for photographing, a most convenient plan is to cut a hole in stout millboard, roughly corresponding to the shape of the medal, but slightly smaller. The piece of millboard is then cut in half, the medal laid down on the copying board, and one-half of the millboard placed closely on each side of it. The two halves are then pinned down with drawing pins and hold the medal fast, without any liability of shadows being cast upon it, as may be the case if it is supported by means of pins of any description.

THE RENOVATION OF DAGUERREOTYPES.

Specimens of the Daguerreotype process are things which not infrequently are brought by customers to a photographic studio under the quite justifiable belief, on the part of their owners, that a photographer necessarily knows all about them and can restore them. We are afraid that this confidence is not always well founded, and, in fact, we have frequently received from professional photographers specimens which were alleged to be Daguerreotypes, whereas, in fact, they were collodion glass positives. Failure to distinguish between the two can arise only from complete ignorance of the two bygone processes. For the specimens themselves are instantly distinguishable. The Daguerreotype, of course, is on a metal plate, whilst the collodion positive is on glass. Inasmuch as a photographer, for his own sake, will not wish to confess his inability to do what is possible in the way of restoring such specimens as these as have faded, and since, moreover, commissions of this kind frequently lead to fairly good orders for copies in the shape of prints or enlargements, we may, perhaps, bring together a few practical notes on the methods of restoring. There is no special difficulty in the work; nevertheless, it should be undertaken at the owner's risk. Those who do not feel disposed to do it themselves can still obtain the services of professional restorers of these plates.

In the first place, it is necessary to satisfy oneself of the nature of the specimen—Daguerreotype or collodion positive. As already said, the support of the image immediately identifies one or the other. Apart from the fact that the two classes of specimen require different treatment, it needs to be borne in mind that the collodion positive is a much more fragile and easily damaged thing, the collodion film becoming, in many cases, almost powdery with the lapse of time so that a touch of the finger or the slightest friction in removing a cover glass may damage the portrait irretrievably. When it is ascertained that the specimen consists of a collodion film on glass, by far the best plan is to decline any attempt at renovation, and to suggest to the customer that the specimen may be copied and reproduced as a print or enlargement in, say, the platinum or carbon process.

In the case of a genuine Daguerreotype, on the other hand, restoration does not call for a great amount of skill. A very little practice with one or two old plates, such as often can be picked up for a small sum in shops selling small miscellaneous second-hand goods, is necessary in order to become adept in the work. Two different processes are employed. In one, the Daguerreotype is treated with a weak solution of potassium cyanide; in the other, devised and recommended by Mr. W. E. Debenham, the plate is treated with hydrochloric acid. We believe both processes are equally effective, but as our experience has been confined to the former we will deal with the practical details of it.

The metal plate, having been removed from its case, and any particles of paper binding removed from the back, the first thing is to remove any dust on the surface by rinsing under a gentle stream of water from the tap. Although the Daguerreotype image cannot be rubbed off by ordinary means, the specimen can be easily scratched, even by the use of a brush. The surface is now flowed over several times with industrial methylated spirit, that spirit is free from mineral naphtha. The ordinary methylated spirit of the drug store should not be used; if the industrial spirit is not readily obtainable the much more expensive spirit of wine is used, a quite small quantity being required.

The plate is now placed in water, and in another dish a weak solution of potassium cyanide is prepared. A definite strength for this latter cannot be specified, owing to the differing degrees of purity of commercial cyanide. A 10 per cent. solution of the commercial cyanide is made and a few drops of this stock added to an ounce or two of water in the dish. This working solution may then be strengthened as is found necessary by adding, a few drops at a time, more of the stock solution. It goes without saying that this addition should on no account be made to the bath while the plate is immersed in it; the further cyanide should be dropped into a graduate, the bath poured back into the latter and then re-applied to the plate. The action of this solution is gradually to remove the tarnish which has caused the so-called "fading" of the picture. At the same time the action must not be overdone, since the cyanide, if given sufficient time, will act upon the picture itself. As soon as the picture is seen to be cleared, the plate is well rinsed back and front under the tap, and now requires only to be dried and replaced in its frame. Drying, however, is an operation which requires to be done carefully in order to avoid the occurrence of streaks or lines which would deface the picture. The most convenient source of heat for the purpose is an ordinary Bunsen burner, as supplied for chemical laboratories, fitted with a rose cap, and thus giving a ring of minute gas flames about 2 inches in diameter. The plate is held by a pair of pliers at, say, the left hand bottom corner, and allowed to drain for a minute or two whilst perfectly still. The top corner is now brought gradually over the burner, and as the plate shows signs of drying it is slowly raised so that the drying proceeds evenly downwards. The object is to secure a regular rate of drying diagonally across the plate, thus avoiding markings or lines. It then only remains to bind the plate with its original cover glass, using a good lantern-slide binding strip or a thin, tough, plain paper in conjunction with ordinary starch paste.

WITH A PORTRAITIST IN THE STUDIO.

[Under the above title there will appear a series of papers by a professional portrait photographer of long experience Mr. J. Effel, whose aim in writing them has been to give to the studio portraitist, as far as possible, the kind of help which he would obtain by the personal guidance of a competent portrait photographer by his side at the time of posing and lighting the sitter. Each article will be complete in itself, but it will be to the student's advantage to consider one in relation to another. As far as possible the papers will be published week by week.]

I.—INTRODUCTORY.

Some years ago, when outlining my ideas of making photographic portraits by a systematised application of definite principles, I was met by the fairly obvious objection that the results of my teaching would be a uniform output of mediocre work. Originality would be completely destroyed; the student would merely glance at his unfortunate sitter, look up his lessons, then briskly proceed to take the portrait according to the instructions.

I was quite prepared for the objection of my friend—an artistic worker of undoubted ability—but I am pleased to say that I converted him to my views, so much so that we now regularly criticise each other's work "by the book."

It is always a safe plan for the revolutionist (in art as in political economy) whose new theories are viewed with scepticism, to point to the state of matters *now*. While it is indisputable that the work of leading photographers to-day far transcends that of a generation ago, it is also true that there are hundreds of studios whose productions from year to year are entirely devoid of any interest whatever, where business is in a chronic state of slackness, and the miserable proprietors tell us that photography is no good nowadays, that the public don't know a good thing when they see it, that they don't know what they want, and that the amateurs have ruined the profession.

Well, it must be admitted that our business is not booming at present; but, unfortunately, there are many others harder hit by the general depression, and I don't think the grumblers are justified in their pessimism. I believe that the principal cause of bad business is indifferent work. If the public have no very clear ideas of what they think good work, they are under no illusions as to what they *don't* like, and they invariably know a *bad* thing when they see it.

To improve the standard of professional portraiture, to give the young photographer definite standards of art values, to systematise all the knowledge and methods of the best craftsmen, to so simplify guiding principles in the production of pictures that the public will appreciate, these are the ideas behind these articles. I will deal with my subject in as simple and popular a manner as possible, in fact I am really writing for those workers who, skilled enough on the technical side of photography, don't know how to improve the artistic quality of their work. Knowing that, in these days of dear plates, very few portraitists can afford to take many positions in an endeavour to satisfy a client, I have constantly kept in mind the man who has to get twelve pictures out of a dozen plates, and satisfy twelve different sitters. I will endeavour to coach you up to a point when you will be able to "weigh up" a subject at once, and, without any fumbling, select the most suitable point of view, the most appropriate lighting, the general tone of the picture.

"But doesn't that make for the stifling of all individuality?" I think I hear you say, and I may be told that a work of art cannot be constructed as a table might be by a joiner after consulting a book of rules.

Well, as it is just this wearisome sameness of "the usual thing" that I am trying to kill, it is unlikely that I would wish to destroy initiative. All I claim to do for the student who desires to create a work of art is to give him in as concise manner as possible, those methods of artists in figure drawing and painting which are applicable to photography. I am certainly nothing of a dogmatist. I believe with Bernard Shaw that the golden rule is that there is no golden rule. We frequently hear that genius breaks all laws, but a close observation of their works has shown me that men of genius were invariably masters of the rules of their craft to which they closely adhered. Now no teacher, whatever his system can make an artist of one devoid of feeling, but, assuming that the young photographer I am addressing has a modicum of taste and some appreciation of beauty, I can help him to get more joy out of his work as well as more profit.

To begin with, we all make our portraits by method. We have fairly definite ways of taking a clergyman, a soldier, a lady in evening dress, and when it comes to physical differences we are also pretty definite, both as to what we wish to show and what we wish to conceal. The well-dressed lady with a classical figure suggests a full-length standing, a simple pose, and an absence of accessory. We know that the stout, ungainly person looks worst sitting back in an armchair, for we want to give the impression of length not breadth. We instinctively over-expose the very freckly face, we never take the man with protruding ears full face, and so on. I merely wish, then, to extend the principles on which you already work, so that you may be thoroughly equipped for any problem that may confront you in the studio.

The broad distinctions I have instanced are obvious enough, but when we have to deal with types not strongly marked, or very ordinary looking individuals who defy accurate classification, the problem of selection becomes more complex. It is said with truth that to do more one must *be* more. Certainly in photography to do more one must *see* more. Quite two-thirds of the whole art of portraiture consists in seeing what there is to be featured: no degree of skill with brush or camera can compensate for deficiency in this respect. Get into the habit of accurate observation. Keep constantly regarding the people you come into contact with daily. Notice the old man sitting opposite you in the tram; see how the blink of sun gives a fine "Rembrandt" light to his face, and think how that effect can be reproduced in the studio. See that comfortable motherly-looking creature with her hands clasped awkwardly on her lap, and note how, with a slight turn that would not interfere with the naturalness of her **attitude**, the hands could be rendered far less obtrusive. Observe the dress, the demeanour, the mannerisms, as well as the figure and features of your friends. Keep constantly looking for something different, even in the most commonplace of persons, and you will be surprised at the infinite variety you will find.

Above everything else study expression, and try to forget the conventions of the studio. Look at the fond mother goo-goo-ing to her baby. Is it fair to complain if she doesn't like the "still life" group of a professional, and prefers the little snap taken by cousin Tom when Sunnums was trying desperately to pull off Mumma's heads?

Let us realise quite frankly that the amateur—even the merest beginner—has this advantage over us, that his portraits are of his intimate friends, that the subjects are seldom posed, are not dressed up for the occasion, and are frequently

taken without their knowledge. Small wonder, then, that a large percentage out of the multitude of snaps have an enduring charm. Looked at in the proper light, the slight "pull" that the amateur has over us should lead us to the scrapping of the artificiality that still clings to most studios, and help us to realise that *the production of a likeness is the first duty of a portrait photographer to his client.*

To put a little method into my own philosophy. I will now ask you to suppose that I am instructing a young assistant. George has served an apprenticeship, and is a capable general assistant, but his knowledge of operating is merely the ability to "take a negative in the absence of principal." George has no art training, but has a keen appreciation of beautiful things, a love for his work, and a keen desire to make good. George and I will now proceed to the studio, and the practical work of taking photographs for the public.

II.—THE BUST PORTRAIT.

Now, George, we are to consider every factor in the production of a portrait, from the filling of the dark slide to the drying of the negative. And that reminds me. Yesterday, when you were filling the slides of the field camera, I saw you run your hand over the film of each plate, the object, I believe, being to take off dust. Nearly every photographer does some caper of this sort, rubbing the plate with his hand, or a camel-hair brush, blowing on it, or knocking the edge on the bench. Think a moment of the dusty changing rooms you have seen, and of the conditions prevailing in a plate factory, and then ask yourself if the plates are not more likely to be dust free when newly taken out of their wrapping paper than after an assistant pawing at them in our dark room. I have known an old hand open a new box of 15×12 plates, very carefully dust each one, then fill them into slides that had not been used for months! This plate dusting is a superstitious survival, and should be discontinued.

We are first going to devote our attention to the head and shoulders or bust portrait. In a sense it is the simplest of all portraits, the artist having to consider so little of the figure, but for the same reason the attention is concentrated on the face, and one has, therefore, to be more exacting with the lighting and expression than in a portrait where the interest is more general.

Before we get a model it will be as well to understand clearly the terms used and their significance. All terms are relative. What is called a side light for a certain subject may be a top light for a different position; a narrow light may become a broad or full light by altering the placing of the sitter or the camera. I will, therefore, give a few rough definitions, which will save me from always qualifying myself.

Side Light.—That part of the light source which illuminates the subject from one side and slightly in front, but which in itself does not usually complete the lighting scheme.

Top Light.—Same as side light, but higher.

Front Light.—Light which falls on the sitter illuminating both sides of the face evenly in a flat, shadowless way. The light largely employed by miniature painters.

Back Light.—Comes anywhere behind the sitter, and is generally employed to supplement the general lighting and to pick out prominent features.

"Rembrandt."—Lighting where the major part of the picture is in shadow. Line lighting and spot lighting are in the same category.

Now, George, we will start our experiments with Mr. Black (my head printer). Which is the better side of Mr. Black's face? Yes, without doubt, the left side. Then that matter is settled. It has become an axiom that the left side is the better one in most cases, and most studios are used with that idea. Shall we take him with the usual soft lighting, or shall we try something of the Rembrandt nature? Most photographs are taken with the head turned away from the light. Experience teaches us that this is the safer way of making portraits for the public, but I want you to see the reason for this. Portrait painters are not hampered by the idea of making their sitters look away from the light, but here let me just point out the fundamental difference between the painter and photographer occasioned by colour.

I spoke of the miniature painter's light. Photograph a sitter with the lighting that gave a charming effect in colour and you will find it quite uninteresting. The delicate nuances, the subtle shading, the intermingling of tints, are destroyed when rendered in black and white and the feeling of roundness destroyed. Broadly speaking, in photography the lighting should have more vigour and contrast than if the picture rendered the colours. Don't waste plates without knowledge. You must train your eye to appreciate effects, and also accustom yourself to allow for the inevitable discrepancy between what you see in full colour and what the rendering will be when translated into monochrome. Get it firmly into your head that until the composition *looks* right it can have no chance of coming right in the negative. Many workers prefer to study the effect on the focussing screen, and certainly one sees nothing there to distract from the picture. The habit should be cultivated, however, of getting the whole arrangement ready before looking at the camera.

Now let us get back to the consideration of the lighting of our subject. Some photographers work always from the same end of the studio, but when it has been decided to feature one side of the sitter that limits our choice of lighting. Few rooms are so built that a bust could not be taken at either end. Don't hamper yourself in any way. Put your foot through all the conventions when you feel strong enough. Work experimentally all round the room, for you can never have too much variety at your command.

Your choice of lighting should be determined by the features or the projections of the face. Irregular features, or the plump, round face with low projections (small nose, etc.), except in the hands of a skilled worker, should be taken looking from the light. As very few of us have classic features, it is easy to see how the traditional lighting came into being, for a portrait in which the subject is turned towards the light is much more exacting to the sitter and more difficult for the photographer. You will find a fascination in thinking out your lighting in terms of the projections of the face. Think for a moment of two prominent public men whose features are known to everyone—Lord Carson and Mr. Winston Churchill. They are very dissimilar, but both are faces of great character and distinction from any angle. To me, however, if I had to economise plates, the nose and chin of Lord Carson demand side-face treatment, and could stand the boldest of lighting, while Mr. Churchill's rounded face and absence of definite lines would make me seek an entirely different style of portrait

We are not going to try anything ambitious with Mr. Black. Just sit down there, please, and let us analyse your face—in the interest of art, you know. You see, George, that the studio is dark; I always begin this way, and let in light as wanted. The great fault with most galleries is that there is too much glass. This studio was built in the old days of slow plates, but as you see, I have the light well under control. It matters not what system of blinds one favours, the essential thing is to be able at will to admit all the available light, or to let in a square foot only, from any part. Now, what is there about Mr. Black that we wish to show, and what are his weak points pictorially? Oh, don't' be afraid; Mr. Black is too sensible to be offended by my remarks when I am giving demonstrations. And, by the way, George, don't ever get into the way of thinking that only with well-dressed,

handsome subjects can artistic pictures be produced. Even a third-rate artist could get a specimen of Gladys Cooper, but the little shop girl, who fancies herself as a rival to Mary Pickford, looks for, pays for, and ought to get something that will show off her charms to the best advantage. Practice selection, and you will be surprised at the beauties you will discover in the commonplace.

Mr. Black has a poor chest. He doesn't want to immortalise this fact, so we will give him all the breadth that we can. Just as he sits there in the chair will do. The arms are too close to the body, giving a sense of weakness. Look always for this in your sitters, women as well as men. Get them to stick out the elbows a little, and when the lines of the arms slope outwards the figure is greatly strengthened. If we were to take Mr. Black looking to the front it would be necessary to turn his shoulders away slightly, as nothing looks more wooden than a portrait with head, body and eyes all in the same direction. I decided against the right side of our subject's face because his mouth droops more at that side and his cheek is sunken in from the loss of teeth. Turn your head slighty away from the light, Mr. Black. The longer the neck, George, the more one may turn the head. There are two ways of shortening a neck—turning the head as much as possible without strain or heightening the camera. A stout, short-necked person should never be turned much, and the camera should be lower than usual. A great fault with busts is a too high camera. As we turn Mr. Black's head you will see the broken line of the bad cheek silhouetted against the background. Keep turning until you lose this as much as you can. Mr. Black's face is not one for profile treatment, the head and nose are shapely, but the chin is weak. There, now, I think we have a point of view that would give his friends a "speaking likeness," but there is not sufficient light. We will consider that problem.

Think of the face as a physical geography map and try to render all its hills and dales and different planes (a subtle pun there, George) so that your picture gives the feeling of roundness and "stereoscopic" effect. Remember that the camera is limited, having only one eye; I would again say in this respect slightly exaggerate your effects in lighting to make up for the inevitable loss. Most bust portraits have too much light. One can retouch the face with light and take all the character out in the studio, with bad lighting, just as an incompetent retoucher does on the negative. When you consider that about two square feet will cover the interest in a bust, you will see this. Mr. Black has hollow cheeks; if the light is too much from the side there will be an exaggeration of this defect, too much front light, and his cheeks will be unnatural. If you wish good "modelling" in your work be very sparing with front light. A negative with the hollows and lines over-accentuated can be considerably modified in the retouching, a negative where all the features are reduced to one plane is hopeless.

Think always of the age and disposition of your sitter. Mr. Black is not a young man, and doesn't want to look like one, but although age has left her mark on his face, he wants to look his best. Flattery is good business, but it must be used with discretion, for few intelligent persons wish to look like wax figures. Now look at Mr. Black's head. Men of our age, when their hair is thin and grey, are apt to be sensitive. Top light shows us at our very worst. Keep the light low for our subject. Just a moment, George, till I make my meaning clear; let in a good streak of top light and see the billiard-ball effect of the forehead, and also notice how the small chin is in shadow and looks even smaller. This is the exact wrong lighting. Keep careful watch over the effect while I readjust the blinds. See how the chin comes out, the head loses the dome effect, and the wrinkles are less like tramway lines. You can soon learn to "retouch with light" by regarding a sheet of corrugated paper and noting the shadows cast by the wrinkles, in different lights, with the lines perpendicular at one time and horizontal another.

Well, there we have our respected foreman ready to be "operated" on—horrible word that, George, I wish someone would invent a better. Do you suggest any modification of the scheme? A little too dark on the shadow side? Glad you mentioned that; that shows observation. Now it is a trifle dark on the far side, but I did that purposely. So far we have made no mention of the background, contenting ourselves with the screen that was last in use. Yet the tone of the background plays a part in the composition that cannot be ignored.

The essential function of a background is to afford contrast to the figure, but it can also be used to hide unpleasing features. Take a completely bald head, place behind it a black screen, and you have a monstrosity. Take another of the same subject, with a ground as near the tone of the head, so that the one merges into the other, and the result will give infinitely more satisfaction. It was on that principle that I left the shadow a little dark on Mr. Black. Bring up the reflector and watch the model all the time. Now don't you see that with the shadow softened the broken line of the cheek stands out too much? That's why I preferred to "lose" the outline in the background. I shall have a lot more to say, when I come to treat full lengths and groups, about the choice of suitable grounds. Meantime, focus this very patient subject and I'll expose the plate.

Now, Mr. Black, this is for the male beauty competition, you know—ah, that's the trouble over. See that negative developed to-night, George, and we'll go over the points again to-morrow and see if we have been successful. Before you go, Mr. Black, I want George to notice the last thing I consider in a portrait, and the one that is of supreme importance—the eyes. I was too busy tricking Mr. Black into a happy expression to lecture you on this point. I just wish to draw your attention to the direction in which the eyes are looking. Many pictures are spoiled by the photographer not knowing definitely where the subject should be looking; in sitting figures the fault usually being that they look too high. This is explained by the fact that the photographer is standing when making the exposure. You noticed that I sat down to snap Mr. Black. Keeping him in conversation, and knowing that his eyes looking to me gave the right direction to them, I was saved the "look at this object and smile" method. Try hard to forget all these well-worn tricks, George.

Now for the determining factors in the direction of the eyes. If you have difficulties with a client, don't experiment or fumble. Consult me afterwards, or reconstruct the problem with a model, but get certitude, always give the impression that you are master of your technique. Just stand up, Mr. Black, and look straight to the camera. Now slowly turn your head round to the right. Round, round you go; go on, further round. What's that? You can't twist any more without shifting your feet? Quite right, that's just the point I wanted to bring out. Well, thank you, Mr. Black, I'll come down presently and select those whole plates for toning. Now what was that turning performance for, George? I wished to show you the sequence of the various movements that have taken place. A figure at "attention" with "eyes front" slowly turns round. The eyes move first, the head next, then the body, and the feet a reluctant last. In all pictures suggesting movement this formula must be adhered to. Except for the expression of certain emotions, *the eyes should always be looking slightly in advance of the direction in which the head is turning.*

We'll come back to most of the points in future lessons, George, but before finishing this morning, let me ask you to go over in your mind the many factors to be considered in the making of a simple head-and-shoulders picture. Only by assiduous study, co-ordination of all your knowledge of the craft, and persistent practice on lines suggested by your newly-acquired information will your work improve. I hope I have helped you somewhat away from uncertainty and towards method.

J. EVVEL.

GRAIN STRUCTURE *v.* LIGHT QUANTA IN THE THEORY OF DEVELOPMENT.

(Communication No. 24 from the British Photographic Research Association Laboratory.)

Recent investigators have shown that the developability of the silver halide grains in a photographic emulsion is due to the existence on their surfaces of some kind of "reduction centres" which are distributed amongst the grains according to the laws of chance. Opinion is at present divided as to what these centres actually are, or how they are formed. Some take the view that the centres exist in the grains from the time the emulsion is made, the function of the light being merely to change their condition in some way. Others believe that the centres are first formed by the incident radiation, and that they do not exist in the grains as specially sensitive points before exposure. Some even suggest that these "reduction centres" are the actual points of impact of discrete light-quanta. This view was taken by Lowry in the discussion following a recent paper of Svedberg's ("Phot. Jour.," 1922, 62, 193). The idea of the bombardment of the grains by discrete quanta is the basis of an exhaustive mathematical theory of photographic exposure in a recent paper by Silberstein ("Phil. Mag.," 1922, 44, 257), published since the experiments to be described were completed.

It seemed of extreme importance to attempt to render these "reduction centres" visible by some means not involving the action of any kind of radiation, and to study the laws governing their distribution. Experiments were therefore commenced early in this year, and were based on the results obtained by Bancroft, Perley and others ("J. Physical Chem.," 1910, 14, 292, 648), who found that a dilute solution of certain reducing agents will affect a dry plate in such a way that the silver bromide can then be reduced by the ordinary developer under the usual conditions. This is the case with such reducing agents as stannous chloride, sodium arsenite and hypochlorite. (Cf. also a later suggestion of Renwick, using hydrogen peroxide, "Phot. Jour.," 1922, 62, 196.)

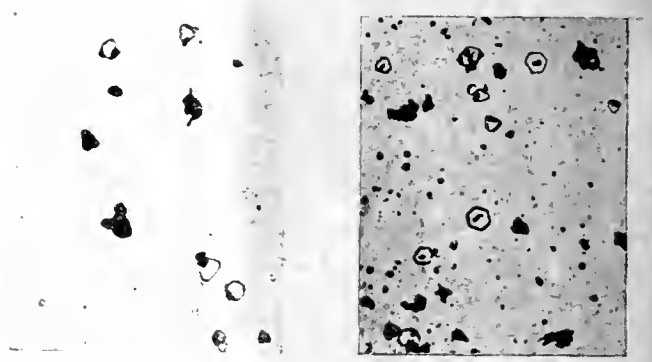
Preliminary qualitative experiments were carried out with stannous chloride and sodium arsenite in 10 per cent. solution. Stannous chloride was found to affect the gelatine of the plate, causing it to become brown, and difficulty was experienced owing to the hydrolysis of the salt. Attention was therefore confined to the sodium arsenite, which gave clean results, free from apparent action on the gelatine. Strips of an ordinary commercial ultra-rapid plate were soaked for varying times in a 10 per cent. solution of sodium arsenite and then washed, developed in amidol developer, and fixed. Images were thereby obtained without light-action. The density of these increased with increase in time of exposure to the arsenite, up to a maximum, further exposure producing reversal. This confirms the work of Perley (*loc. cit.*).

Attempts were then made to see whether the development of the silver halide grains after treatment with sodium arsenite solution proceeded in the same way as when light is used, or X-rays, for rendering the grains developable. Single-layer plates were prepared from a commercial ultra-rapid plate in the manner described by Slade and Higson ("Proc. Roy. Soc.," 1920, 98, 158). The grains in the emulsion were mostly flat plates, and varied in area from about 0·5μ^2 to 5^2 The emulsion used was the same as that employed by Toy in his experiments, the results of which are to be published in the "Phil. Mag." (in the press).

The single-layer plates were treated with sodium arsenite solution, washed, partially developed in amidol developer (Amidol-0.4 gm., soda sulphite saturated solution, 100 c.c.s., potass. bromide, 10 per cent. solution, 6 c.c.s.), and again thoroughly washed. All these operations were carried out in ruby light (the filter used transmitted light only of wave length greater than 6,400 A.U.), the plate being shielded from the red rays as much as possible. The conditions for the production of a plate suitable for examination were 30 secs. exposure to 10 per cent. sodium arsenite solution, washing for 3 minutes and developing for 42 seconds.

With the above exposure to the reducing solution there was very little lattitude in the time of development, a few seconds one way or the other causing the grains to be either completely changed or unaffected.

In dealing with a liquid such as sodium arsenite solution accurate control of exposure is more difficult than in the case of light, since the time of diffusion of the solution to and from the gelatine of the emulsion is an important factor, and any inequalities in the coating of the plates will tend to give non-uniform exposure. In the present experiments the solution was kept constantly in motion over the surface of the plate while the exposure was being made, and the coating on the plates used was exceedingly thin. The plate obtained as described was examined in the microscope. A few of the



a *b*

Fig. 1.—(*a*) Exposed to light (*b*) Exposed to 10 per cent. sodium arsenite solution. Both (*a*) and (*b*) are partially developed.

grains were observed to be completely changed, but the majority showed centres, in appearance, exactly similar to those obtained by Toy when the exposure is to light (see Fig. 1).

The distribution of these centres among the grains was then examined in the manner used by Svedberg (*Phot. Jour.*, 1922, 62, 186-192) and Toy (*loc. cit.*). These investigators, the former for light and X-rays with a slow emulsion, the latter for light with the flat grains of a very fast emulsion, have shown that the "reduction centres" are distributed amongst the grains according to the laws of chance; that is, the probabilty for the occurrence of r centres in a grain is denoted by

$$P_r = \frac{(N_0)^r}{r!} e^{-N_0} \quad . \quad . \quad . \quad . \quad . \quad (1)$$

where N_0 represents the average number of centres per grain. 400 grains were examined and the number of centres on each grain counted. The probability of occurrence of r centres on a grain was calculated from the observed figures by dividing the number of grains each having r centres by the total number of grains. The grains counted were of approximately triangular shape and all of the same size (area of flat surface=2.73μ^2; *cf.* Toy). The results which

were obtained are shown in the following table; they are plotted in fig. 2 against the theoretical curve of equation (1).

Number of grains counted = 400.
Total number of centres = 764
$N_1 = 1.91$.

Number of Centres per grain = r.	Number of Grains.	P_r	
		Observed.	Calculated from equation (1).
0	89	.172	.148
1	111	.277	.283
2	100	.250	.270
3	57	.142	.172
4	39	.097	.082
5	19	.047	.032
6	4	.011	.010
7	1	.0025	.0027

When the difficulties which occur in such experiments, especially those in controlling the exposure to the arsenite solution, are taken into account, the agreement between observed and calculated values is very satisfactory; it is even better than that obtained by Svedberg with light and X-rays.

It has been shown by Toy (*loc. cit.*) that in the case of the flat grains used by him the ratio of centres occurring on

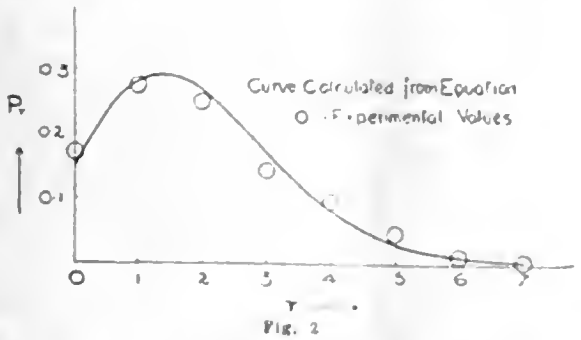


Fig. 2

the edges of the grains to those either on the flat surface of the grain or inside it was approximately 2.5 : 1 when the exposure is to light. Similar measurements were made on the single-layer plate which had been exposed to sodium arsenite. The grains investigated were of the size 2.73 μ^2 as before, and the results obtained were as follows:—

Number of grains examined = 70.

Number of centres on edges of grains = 67.

Number of centres inside and on flat surface = 29.

Ratio of centres on edges to centres inside and on the flat surface = 2.3 : 1.

It will be seen that the ratio thus obtained is in good agreement with that obtained by Toy with light and grains of the same size and from the same emulsion.

It seems, therefore, very probable that the reduction centres made visible by means of the chemical reducer, sodium arsenite, and subsequent development are the same as those which would be observed if light or some other form of radiation had been employed as the means of rendering the grains developable. The centres located by means not involving the action of any kind of radiation follow exactly the same law as regards distribution among the grains, and also as regards the topographical distribution of the centres on the individual grains themselves. The only other possibility for the reduction of the silver halide from specific points appears to be merely that the developer reaches one part of the grain before another. This has been discussed by Toy (*loc. cit.*) and shown to be untenable.

The above results, therefore, indicate that the reduction centres are an essential part of the grain structure, and that they exist in the grains from the time the emulsion is made. The action of radiation is certainly not necessary for their formation, and the idea that they represent the points of impact of discrete light quanta is not in accordance with the experiments here given. What the actual nature of the reduction centre is, and how it is rendered active by the action of light and of chemical reducers, remains to be seen. Investigations in this direction and a continuation of the experiments described are now being carried out in this laboratory.

In conclusion, the author wishes to express his thanks to Dr. T. Slater Price (Director of Research) and to Mr. F. C. Toy for their interest in these experiments and for much valuable criticism and advice.

W. Clark, B.Sc., A.I.C.

Assistants' Notes.

Notes by and for assistants will be considered for this column. Payment for accepted contributions is made on the first of the month following publication.

On Getting On.—For Young Assistants.

One often hears and reads about great men, captains of industry, statesmen, judges, admirals, etc., who were totally incapable and worthless as schoolboys; and also of brilliant scholarship champions who left school or university to go rapidly to the dogs. Now, the truth in this and there is a certain amount—applies to men in most ranks of life, and to photographers, but in the last case it applies in a modified degree.

The bright, intelligent boy who enters the photographic trade or profession has not the slightest need or likelihood of being left behind by the dunce if he will remember just one or two things. And the slow-thinking plodder need not win the biggest success any more than he need go to the wall. But each boy or girl must believe me when I say that he or she will be the biggest factor in his or her success or failure.

I have had a fairly comprehensive experience of junior assistants and apprentices in my time, and I think I can best make plain what I am getting at now by taking an example that has occurred. A certain youth, whom I will call Felix because that wasn't his name, was promoted from running errands to assisting in a small dark room, where he would have every opportunity of learning, but not much work. The fact was he was considered too brainy altogether to be wasted on messages. He very soon proved that he was brainy, really so, and had an aptitude for the craft. In a week he had bought himself a small camera. Soon after that he could take a really good portrait photograph. Things developed till he was photographing his relatives and selling them copies; in fact, I have never come across equal at rapid photographic success.

But, alas! he got the sack. Why? Because it is not possible for a boy to study even his own profession to such an extent in the boss's time and look after his job as well. Our friend was too brainy, inasmuch as he could not be convinced that the work given him to do was far and away more important than the work he felt like doing himself. Consequently, things were forgotten, other assistants suffered through his errors and omissions, and finally the boss got "fed up."

When he was promoted, another boy—we'll call him Jacob—was given the "errand" vacancy. Jacob was a totally different style. He, too, had a camera, but couldn't use it for toffee. But he was good at errands; never wasted any time, didn't stay out when any local festivities were on in an endeavour to get Press photographs. Jacob was content to do what was allotted to him, and do it well. After that he did nothing. Not that he was mechanical. He had some brain, certainly, and within reason he used it, but when he was given the same promotion that Felix had wasted he was never guilty of turning his back on a dish of developing prints in order to try to talk panchromatism. He followed instructions intelligently, and was quite content to learn as he went along. Jacob did well.

The moral will, I think, be plain. Talent, and even more so, genius, is valuable in photography, but it must be kept in hand and controlled. The acknowledged leaders of the craft must be careful where they tread, because, considered from a scientific, artistic, or business point of view, it is a mightily cantankerous

subject is this same photography. How much more, therefore, must the new recruit walk warily? Common sense, diligence, consideration for other people (even including the poor old boss), punctuality, are as valuable assets to the young photographer as they are to anyone else who wants to get on solidly.

There is no need to go to the other extreme if one is blessed with a little extra gumption. I remember when I was young I could never be cajoled into photographing anyone or anything out of business hours. Photography was my paid job, and there it began and ended. This was silly, and later on I saw the mistake, and began to take a secondary interest in other lines of photography, but this I kept strictly separate from my job. It is quite possible to study photo-micrography, say, at home, and some day it may be of very great use, and if a youth cares to confide in his employer—but not when the latter is up to his neck in work or worry—it is always possible that he will experience the other's interest and goodwill.

So always try to give your best to the work you are paid for, and don't neglect it. Walk squarely before you run, run before you soar. Few are born into their own high-class studios, and some of those go smash. Many have got there by the slow process of deliberate self-advancement, however, and these are the class who have brains, and brains to use them rightly.—THERMIT.

Tidiness in Trimming the D. and P. Prints.

WHERE a very large number of small prints have to be trimmed, and particularly when the work is being done under rush conditions, the workroom is very liable to get into a most untidy state through the collection of the trimmings on the floor. As shown in fig. 1,

Fig. 1.

all this mess can be avoided by providing a wide slot in the working bench close to the place where the trimmer is used. The trimmings then collect in the drawer as shown in fig. 2. This latter figure

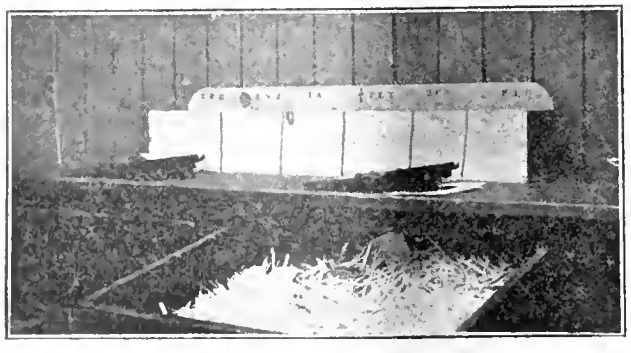


Fig. 2.

also shows another handy accessory for the trimming bench, namely, a box divided into a number of sections, each for prints of a particular size. By using the box prints are sorted out into their proper sizes as fast as they are trimmed, and much labour in subsequent sorting is thus saved.—L. HIRSTWOOD.

FORTHCOMING EXHIBITIONS.

August 26 to September 9.—Toronto Camera Club. Secretary, J. H. Mackay, Toronto Camera Club, 2, Gould Street, Toronto, Canada.

September 9 to October 7.—London Salon of Photography. Latest date for entries, August 30. Particulars from the Hon. Secretary, London Salon of Photography, 5a, Pall Mall East, London, S.W.1.

September 11 to 15.—Professional Photographers' Association, Princes Galleries, Piccadilly, London, W. (Trade and Professional). Hon. Secretary, Richard N. Speaight, 157, New Bond Street, London, W.1. Also foreign invitation loan exhibition of professional portraiture. Hon. Secretary, Marcus Adams, 43, Dover Street, London, W.1. Latest day for entries and exhibits, August 31.

September 18 to October 28.—Royal Photographic Society Annual Exhibition. Latest date for entries, August 25 (carrier); August 26 (hand). Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

October 18 to 28.—Portsmouth Camera Club. Latest dates: Entry forms, October 11; exhibits, October 16. Particulars from the Hon. Secretary, C. C. Davies, 25, Stubbington Avenue, North End, Portsmouth.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, July 17 to 22.

PRINTING-SURFACES.—No. 19,723. Appliances for production of printing-surfaces by photography. T. W. Brown, A. Orreli, and J. Robertson.

PRINTING FRAME.—No. 20,085. Photographic printing frame. W. J. Brown.

PRINTING.—Nos. 19,996, 19,997, 19,998, 19,999. Photographic printing. E. K. Hunter.

COLOUR PHOTOGRAPHY.—No. 20,070. Photo-colour process. M. Martinez.

CAMERA ATTACHMENTS.—No. 19,699. Devices for attaching photographic apparatus, etc., to base. F. N. Trier.

MOUNTS.—No. 20,148. Photographic mounts, albums, etc. J. Walker.

CINEMATOGRAPHY.—No. 19,918. Motion-picture projection apparatus. Pathé Cinéma Anciens Etablissements Pathé Frères.

CINEMATOGRAPHY.—No. 19,919. Electric lamps for cinematographic apparatus. Pathé Cinéma Anciens Etablissements Pathé Frères.

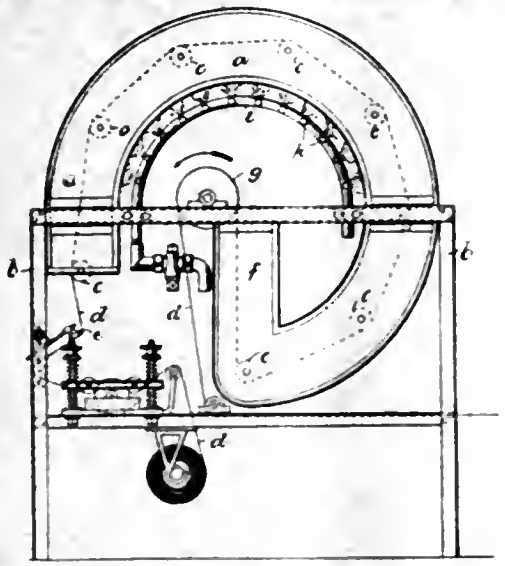
COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

COLOUR PRINTS FROM SCREEN-PLATE NEGATIVES.—No. 182,167 (March 21, 1921). The invention consists in the making of prints in colours on a paper or other opaque support from a screen-plate transparency in complementary colours, obtained in the usual way by development of the image to a negative without subsequent reversal. The essential in the invention is the use, for the screen-plate mosaic filter-film of mixtures of dyes, some of which, by treatment with acids or alkalies or by other chemical treatment, are rendered colourless, and some of which are originally colourless but become coloured by the above treatment.—Michael Obergassner, 31, Kaufinger Strasse, Munich. (Details of the process are given on another page in the "Colour Photography" Supplement.)

Drying Blue-Print Paper.—No. 179,832. (May 25, 1921). A drying-chamber for ferroprussiate and like photographic papers is of circular or polygonal form, and is so arranged that the treated side of the paper is not touched during its passage



through the chamber. The drying chamber *a* is supported by a frame *b* and rollers *c*, over which the paper *d* passes after it leaves the scraper *e* of the coating-apparatus. External heating-elements extend over the greater part of the chamber, but internal electric heating bulbs coloured or treated to avoid harmful actinic rays may be substituted.—John William Davies, 30, Rothschild Road, Chiswick, London, W.4.

Ferrotype Cameras.—No. 179,451 (June 8, 1921).—The casing *a* of the camera is of suitable rectangular shape. The front wall is provided with a hole in which is fixed a socket *b*, the inner end of which is provided with an inwardly extending flange b^1, to support the lens *c*, the latter being secured by a ring *d* forming a tight fit within the socket.

Mounted on the front of the camera is a metallic plate *e*, secured thereto by screws e^1. The vertical sides of this plate are formed by bending into U-shaped guides e^2 within which is slidably mounted a plate *f*, the upper edge of which is turned outwardly at f^1 to form a lug by means of which it may be raised within the guides. Suitable stops may be provided for limiting the movement of the shutter plate *f*, the arrangement

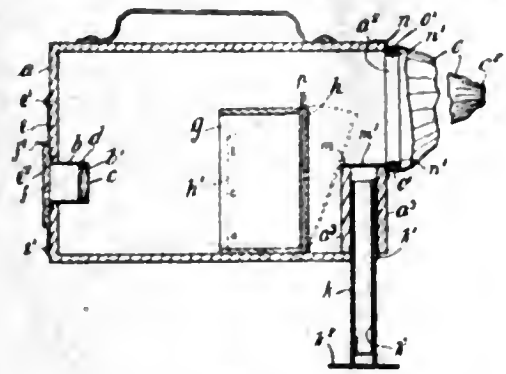


Fig. 1.

being such that the plate *f* is raised to its maximum extent to uncover the aperture e^3 (fig. 2) in the frame *e*.

Within the camera casing *a* is rigidly fixed a box-like frame *g* open at its front and rear, and embracing this frame is a holder *h* formed of sheet metal the sides h^1 of which extend forwardly and engage the outer walls of the frame *g*. The sides of the holder are preferably provided with projections h^2, whilst the sides are so shaped that they have to be sprung apart to place the same around the walls of the frame *g*.

The rear wall of the camera casing is open at a^2, whilst the lower portion of the rear wall is provided with a double wall a^4 within which is placed a tank or receptacle *k*. The tank *k* is of such size as to form a snug fit within the chamber walls a^3 and is provided on one side with a rib k^1 abutting against the bottom of the rear wall a^3 so as to limit the exent to which the same may be inserted. The bottom of the tank may have a base plate k^2 fixed thereto to enable the same to stand on a table or other surface, when removed from the camera.

Within the tank is loosely but slidably mounted a fork-like member k^3 the upper and lower ends of which are provided with U-shaped portions on opposite sides thereof. The lower U-shaped portion serves to support the plate or card placed

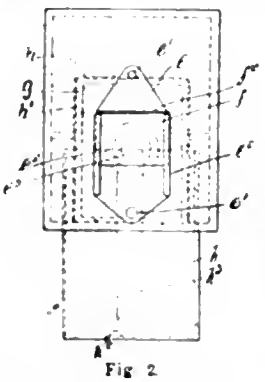


Fig. 2.

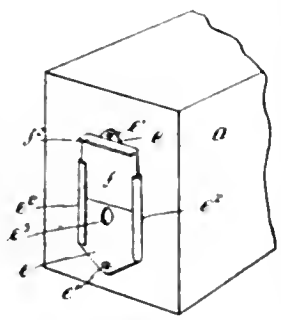


Fig. 3.

therein, and when the fork is raised the plate or card will be raised to a position to be easily removed.

The top of the rear wall a^3 is closed by a felt strip *m* provided with a longitudinal slit m^1 through which the plates or sensitive cards may be passed.

Surrounding the opening a^2 of the rear wall of the casing *a* is a flanged frame *n*, which is provided with a projecting channelled flange n^1 the concave side of which is turned outwardly. *o* is a sleeve of tubular form, formed of opaque fabric, the inner and outer ends of which are provided with a hem. The inner hem o^1 is adapted to receive a cord which, when the sleeve is placed in position with the hem around the channelled flange n^1, permits the sleeve to be secured to the frame in a light-tight manner. The hem o^2 at the outer end of the sleeve is preferably provided with an elastic cord or the like which normally partially closes that end of the sleeve. When the opaque sleeve is thus secured in position, the hand of the operator may be inserted into the outer end and by passing the hand through the sleeve the plates or cards may be placed in position or removed from the holder and passed through the slit in the felt strip *m*.

The strip *m* is normally sufficient to prevent light entering the casing *a* when the tank is removed, and when the plate is to be placed in position the top of the holder *h* is pulled back, causing the same to pivot about the bottom of the rear-portion hereof which rests on the bottom of the camera, the inner surface of the hollow wall a^3 limiting the rearward movement thereof as shown in dotted lines in fig. 1. The cards or plates *p*, are placed in position against the inclined inner face of the holder which is

Fig. 4.

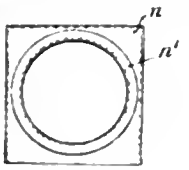


Fig. 5.

then pressed forwardly to the position shown in full lines. After the photograph has been taken, the hand is again inserted through sleeve *o* and after pulling back the top of the holder *h*, the front card (if more than one are carried by the holder) is removed and inserted through the slit m^1 into the tank *k* which has previously been supplied with combined developing and fixing solution.

The hand may now be withdrawn from the sleeve *o* and the latter is pushed into the opening at the rear of the camera. The tank *k* is retained in position within the hollow walls of the casing for a sufficient time to enable the developing and fixing of the plate or card to be effected, and when this operation is completed,

the tank is withdrawn, and by raising the fork k^3 the plate or film may be removed. Before the withdrawal of the tank takes place the opaque sleeve o is preferably pushed into the body of the camera to prevent any possibility of the light entering the camera through the slit m^1.—Edmond Francis Stratton, 1, Cedar Street, South Norwalk, Connecticut, U.S.

The following complete specifications are open to public inspection before acceptance :—

COPYING.—No. 183, 124. Device for copying the surface to be obtained from a photo-stereogram of a spatial form. Firm of C. Zeiss.

TELEGRAPHIC TRANSMISSION.—No. 183,135. Transmission of photographic images by means of the usual telegraphic, telephonic and radio-telegraphic apparatus. U. and P. Ellero.

New Apparatus.

Pentac f 2.9 Anastigmat Portrait Lenses. Made by J. H. Dallmeyer, Ltd., 11d, Regent Street, London, S.W.1.

THIS series of lenses has been introduced with the object of providing the portrait photographer with objectives of larger aperture than has hitherto been available in any type of lens. While small lenses, particularly those for cinematograph cameras, have been made, notably by Messrs. Dallmeyer, of considerably larger aperture than f/2.9, they have been of quite short focal length. In the present series focal lengths of 6, 8, 10 and 12 inches are available, representing a much more difficult optical problem. It may be questioned whether there is a considerable proportion of studio subjects for which so large an aperture as even f/3 can be employed, for very frequently a smaller stop must necessarily be used in order to secure sufficient definition in planes at different distances from the camera. Yet subjects do frequently arise for which the portrait photographer badly needs all the rapidity which he can obtain from his lens, and from that standpoint the new Pentac anastigmat represents, so to speak, a reserve of power which can often be advantageously drawn upon.

As the result of examining the lens which has been sent to us, namely, one of 8 inches focal length, we find that it covers satisfactorily the plate for which it is listed, namely, the 5 x 4. The 6-inch lens is made for quarter-plate; the 10-inch for half-plate; and the 12-inch for 7 x 5 inches. The prices are as follows :—6-inch, £18; 8-inch, £24; 10-inch, £32; and 12-inch, £40. For an additional cost of £2 10s. the lens may be obtained in a mount providing for a certain degree of diffusion of focus. The new objective represents a further power in the hands of the studio portraitist, and will undoubtedly find its application both by those who require to cut down exposures in daylight studios to the shortest possible time when dealing with such subjects as young children, and also by others who may be compelled to use gas or other artificial illumination with which the employment of an ultra-rapid lens is a sine qua non in reducing exposure to a time which is readily obtainable with other systems of artificial illumination.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, AUGUST 7.

Bournemouth C.C. Onting—Romsey.
Edge Hill C.C. Outing—Burton, Puddington and District. 9.30 a.m. Pier Head.

TUESDAY, AUGUST 8.

Bournemouth C.C. "The Carbro Process." A. Atkinson.
Hammersmith Hampshire House P.S. "Gum-bichromate." J. W. H. Saybourne.

WEDNESDAY, AUGUST 9.

Partick C.C. Print Criticism.
Rochdale A.P.S. "Tips for a Photographic Holiday." J. C. Wild.

SATURDAY, AUGUST 12.

City of London and Cripplegate P.S. Outing—Richmond and Kew.
Edinburgh P.S. Outing—Niddrie House and grounds.
Exeter C.C. Outing to Culver.
Hackney P.S. Outing—Wimbledon to Richmond.
Partick C.C. Outing to Baldernock.
Sheffield P.S. Outing to Youlgreave.
Willesden P.S. Outing to Rickmansworth.

CROYDON CAMERA CLUB.

Mr. W. C. Price gave a lecture on "The Formation of the Fine Art Trade Guild," an important association within the sphere of its operations, but unheard of by many members.

The Guild was founded in 1910, and comprises fine art publishers, painter-etchers, and others, and retailers. It was preceded by the Printsellers' Association, a body which did useful work, but lacked sufficient authority to enforce its decrees, and eventually it became absorbed by the guild.

It swept away many abuses which had crept into the trade, and by strength of membership was soon able to make binding laws, and inflict penalties for disobedience to them. On one occasion, Mr. Price said, a celebrated West-End firm flatly defied the Guild and was immediately expelled. In less than a fortnight, forced by necessity, an abject appeal was made for pardon and reinstatement. The firm was penalised by three months' isolation, and then re-admitted.

The main functions of the Guild are to uphold the dignity of the trade and protect the public from fraud of any description. Purity of medium is insisted upon, and woe to the publisher who gives, say, a mezzotint a little reinforcement with aquatint. The Guild will, therefore, not appeal to the photographic pictorialist of the medium-mixer type.

It safeguards the purchaser as to the number of proofs issued, limits their number, inspects and passes each proof, and stamps it. On the left-hand in earlier proofs; on the right in later. After "Letter-proofs," subsequent prints (in the eye of the Guild) are considered of no value, and are not stamped, but when the issue is completed the plate is destroyed. In old days many a time has a much worn plate been sent to the Continent to be refaced with steel, and inferior prints pulled from it, and imported in thousands, much to the detriment of the original purchasers.

The Guild has now many branches, and has turned its attention to the art education of assistants engaged in the trade. Lectures are given by prominent men, and a library is in course of formation. A most hearty vote of thanks was accorded Mr. Price for a lucid sketch of an interesting and powerful corporation.

Prior to the close of the evening the secretary, Mr. J. M. Sellors, announced he was going on a holiday, and was, therefore, forced to hand over control to the "office boy." He hoped for the best, and feared the worst. Several informal fixtures had been arranged. The member just alluded to would give an evening on "Manners and Deportment in the Saloon Bar," Mr. Vivian Jobling acting as barmaid. Mr. Harpur would expound on "Modesty," and the President on "Silence." This intimation considerably astonished those principally concerned.

A NEW STYLE OF SKETCH PORTRAIT.—The Sketch Portrait Co., of 18, Doughty Street, London, W.C.1, send us a specimen of a new style of sketch portrait which they are introducing in a very neat pattern of passe-partout framing. The portraits range in size from 10 x 6 inches to 19 x 14 inches, and are supplied at prices from 8s. 6d. to 30s. each. The specimen before us of 17 x 12 size is a remarkably effective piece of work in black and white, in which full use is made of cross-hatching both in the background and in parts of the figure, with the result that the portrait has very largely the effect of a pencil sketch, the photographic tones contributing, as it were, the fine shading which a draughtsman would produce with his pencil. The portraits are also executed in a similar style in sepia and water-colour, and we are quite sure that the freshness and novelty which they exhibit will recommend them to photographers seeking something different, yet of distinction, for their show window. The Sketch Portrait Co. is making a special offer to supply a set of three of these portraits from a photographer's negatives, one in water-colour, one in sepia and one in black-and-white, each of 17 x 12 inches size, carriage paid for 35s., and it is an offer which may advantageously be accepted.

Commercial & Legal Intelligence.

LEGAL NOTICES.—Notice is given that a general meeting of the members of the London Photographic Co., Ltd., will be held at 48, Langler Road, Willesden, N.W.10, on August 23, at 8 o'clock, for the purpose of considering the liquidator's report, showing how the winding-up of the company has been conducted, and its property disposed of.

Notice of intended dividend has been given in the case of James Alfred Derbyshire, artist, photographer, etc., residing at 1, Joddrell Street, Newtown, New Mills, and carrying on business at Goyt Studio, New Mills. Proofs must be lodged on or before August 8, with Archibald Yearsley, 27, Brazennose Street, Manchester, the trustee.

NEW COMPANIES.

ANGLO-FRENCH FILMS, LTD.—Registered July 21. Capital, £1,000 in £1 shares. Objects, to carry on the business of producers, manufacturers and exploiters of, agents for, and dealers in cinematograph films, phonographic records, cinematographic and photographic and kindred machinery, etc. The subscribers (each with one share) are:—G. E. Binsted, 168, Putney Bridge Road, Putney, S.W.15, solicitor's clerk; E. W. Howard, 8, Rye Hill Park, Peckham Rye, S.E.15. Registered office: 317, High Holborn, W. C.1. Private company.

News and Notes.

THE DERBY PHOTOGRAPHIC SOCIETY, which has been derelict since 1915, has been revived, and Mr. T. A. Scotton, of 179, Osmaston Road, Derby, has been appointed hon. secretary.

THE REFEREE, in its issue of Sunday last, exhibited the interest of its manager, Mr. H. C. Pharaoh, in photography, by publishing a special photographic article, by Mr. P. R. Salmon, on holiday photography. It is intended to make photographic notes a more or less regular feature of this popular Sunday newspaper.

LETO PHOTO MATERIALS CO., LTD.—It is announced by Messrs. Wellington & Ward, Ltd., that they have acquired the business of the Leto Company. The manufacture of Seltona will be carried on exactly as hitherto, but all communications, orders, etc., should be addressed to the firm of Messrs. Wellington & Ward Ltd., Elstree, Herts.

MESSRS. JOHNSON & SONS, Manufacturing Chemists, Ltd., of 23, Cross Street, Finsbury, E.C.2, have received a postcard with a Bristol postmark bearing an inquiry from a professional photographer or a photographic dealer, regarding tank developer for a 5-gallon tank. Unfortunately the card is without name or address, and Messrs. Johnson & Sons think that as the writer of the card is probably a reader of the "B. J.," he will see this paragraph and be able to disclose his identity.

MR. ARTHUR WARMISHAM, M.Sc., has been elected a director of Taylor, Taylor & Hobson, Ltd. Mr. Warmisham, during the years in which he has been with the Leicester optical firm, has introduced a number of important inventions. Among these are the well-known Taylor-Hobson Cooke Aviar lenses, which achieved so much success during the war for aerial photography. Mr. Warmisham also succeeded in producing a cinema projection lens, which is rapidly taking its place in the cinema trade on account of the much greater amount of light transmitted to the screen.

CAMERA.—Under this title an illustrated monthly magazine has begun publication in Lucerne, where it is issued by Messrs. C. J. Bucher. The new publication, which is in the German language, makes a strong feature of pictorial photography, and includes an 8-page art supplement of reproductions of the pictorial work of C. Kosel, of Vienna. Nevertheless, there are a number of technical articles, including one by Dr. E. Konig on his new desensitisers, and another by Dr. Lüppo-Cramer on the grain of plates. "Camera" is published at the price of 1.50 francs per issue, or 16 francs per annum.

ENGINEERING PHOTOGRAPHS.—At their private cinema theatre in Broadway, Westminster, Messrs. Vickers last Friday gave a private view of a series of films which are to be sent to the Brazilian Centenary Exhibition at Rio de Janeiro. These films, which have all been made by the firm's own photographic department, are in seven sections, and are selected to form a judicious blend of the technical and the popular. Two of them illustrate the processes of making steel at the River Don works at Sheffield and the manufacture of files, springs, magneta, guns and other articles: in another the firing trials of the guns are to be seen; another shows shipbuilding and marine engineering operations at the Naval Construction Works, Barrow; and two are concerned solely with aeronautics.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.—Members are reminded that any proposed resolution for the adjourned general meeting, to be held on September 15, must be sent to the secretary six weeks before the meeting, in accordance with Article 20, viz.: 20. Any member entitled to be present and vote at a meeting may submit any resolution to any General Meeting, provided that at least the prescribed time before the day appointed for the meeting he shall have served upon the Association a notice in writing signed by him containing the proposed resolution, and stating his intention to submit the same. The prescribed time above mentioned shall be such that between the date on which the notice is served or deemed to be served and the day appointed for the meeting, there shall be not less than six weeks. Also, according to Article 12. "Every member may nominate any one member for election to the office of President and any other member to the office of treasurer, and every member may nominate four London and four country members for election to the Council. The nomination papers must be sent to the Secretary at least fourteen days before the annual general meeting, together with the written consent of the members nominated to serve if elected."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

CONTINENTAL NEGATIVE VARNISH.

To the Editors.

Gentlemen,—In the interesting letter dealing with the preservation of negatives (published on page 454 of last week's "B.J.") the writer, Mr. E. D. Shortt, speaks highly of a benzene-like varnish used by a Continental firm of view publishers for their negatives, and says that he has been unable to ascertain the formula for the varnish.

I, too, used a benzene-like varnish when employed in a Continental house, but it was by no means a simple and easily made varnish; indeed, we gave it up because of the difficulty of mixing and the too many constituents. However, as your correspondent seems to desire to renew his acquaintance with a benzene mixture I will give him the formula for the varnish we used. It was one my fellow workers and myself did not care for, though it had been used by the firm for a generation or more.

The benzene varnish is a cold one, and the formula stands as follows:—Benzene, 3½ oz.; acetone, 3½ oz.; absolute alcohol, 1½ oz.; sandarac, 300 grs. Mix the solvents, warm slightly on a water bath, and dissolve the sandarac while the combined solution is warm; filter, bottle and keep tightly corked when not in use. Although this contains as much acetone as benzene, it was known to us as a benzene varnish.

Mr. Shortt uses the word "benzine," but this, I should say, is a slip of the pen, and that benzene was intended. Benzine is, I believe, practically identical with petrol, which is rarely, if ever, used for varnishes, whereas benzene (or benzole) is a recognised constitutent of varnishes. A crystal of iodine dropped into benzene turns carmine coloured whilst with benzine a violet colour is obtained. And further, a drop or two of absolute alcohol will not mix with benzine but mixes at once with benzene.—Yours truly,

E. W. H. TAYLOR.

Liverpool.

To the Editors.

Gentlemen,—The "benzine" negative varnish your correspondent thinks so highly of is probably nothing more than the old-fashioned benzole gold size varnish (equal parts of each), which

has been known to old hands for generstions, and is still used by many of them, in spite of the introduction of newer snd improved varnishes for dry-plate work.

A mixture of equal parts of good commercial gold size and benzole (which is benzene and not benzine or benzilene) is one of the best of cold varnishes, in spite of its simplicity. Gold size, it may be said, is really a solution of copal or amber (resins) in boiled linseed oil thinned down with the best turpentine. It is met with in many degrees of purity, from the rather common oilshop variety to the best "copal varnish" supplied for artists of the brush. The varnish takes about half an hour to dry properly, but it appears to be the one your correspondent requires.—Yours faithfully,

E. A. Stokes.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

G.L.A.—We have never heard of the Rutherford engine in the connection you mention, or in fact in any connection, and after making inquiries among process people, who might be expected to know, cannot hear anything of it. If it was a patented engine, you could easily look up the name of the patentee in the annual indexes in the Patent Office Library, 25, Southampton Buildings, Chancery Lane, W.C.2.

G. W.—The average strength of solution of potass bichromate for rendering gelatine sensitive to light is from 5 per cent. to 6 per cent. We have not our previous letter at hand, but we hope we represented to you that it is by no means an easy matter to obtain substantial relief by printing on a bichromated gelatine film. We do not think that there is very much prospect of your getting results which will satisfy you.

R. H.—Local authorities make their own regulations in regard to the practice of outdoor portraiture in streets and on beaches. In most places the Town Council, or other authority, sells the rights to photograph on the beach, and, therefore, prohibits photography by anyone except the concessionaire. As regards other places, police authorities sometimes require the photographer to have a hawker's licence in order to canvass from door to door or to take portraits of passers-by. You had better apply to the chief police office in your town.

A. F.—Most lenses of this double anastigmat type cover, at the full aperture, a larger plate than that for which they are listed, and a still larger one if stopped down. Generally speaking, the lenses which give this facility are those which have not a maximum aperture larger than about *f*/7, it being possible, in a lens of this type, to provide for corrections and covering power over a wider angle than can be done when the construction is directed towards obtaining a large maximum aperture, such as *f*/4.5. We suppose that this is the information which you require.

O. D. B.—Under the circumstances you name we are of opinion that you would do well to keep to the incandescent gas, using the burner marked A on your list, and either the E or G plates. The allegation referred to has been officially denied since you penned your letter. It is stated that the amounts are checked four times before the bills are tendered, and if the public choose they can check the figures themselves. The meter card shows the number of feet consumed, and the scale on the back of the card or gas bill shows how to reduce to therms. The sum is easy. Multiply the number of feet registered by the calorific value of the gas supplied (in your case 500) and then divide by 100,000.

J. J.—For the best rendering of the inlaid mahogany work a panchromatic plate is necessary. You may choose any of the panchromatic plates on the market, and might well use a K2 or K3 screen. You will find there is an enormous improvement in the rendering of the woods and also of the grain of each one by this combination. The little book, "Commercial Photography," which we issue, contains a lot of information, but the best treatise on the subject is "The Commercial Photographer," by L. G. Rose, an American book published by F. V. Chambers, 636, Franklin Square, Philadelphia, Pa., U.S.A., price 4 dollars. So far as we know, it is not on sale in this country.

D. B.—The formula for the retouching medium you refer to is:—

Pale gum resin	200 grs.	230 gms.
Gum dammar	90 grs.	100 gms.
Gum mastic	20 grs.	23 gms.
Oil of juniper	1 gr.	1 gm.
Oil of turpentine	2-4 ozs.	1,000-2,000 c.c.s.

The gums are powdered and added to the oils, and finally enough pure asphaltum is added to give the mixture a dark amber colour when viewed through the depth of an inch. This formula is strongly recommended by Whiting in his "Retouching" as not liable to pick, rub off, or come off on after-varnishing. It takes a great deal of work.

W. F. G.—The formula for copper toning is:—

A.—Copper sulphate	60 grs.	7 gms.
Potass. citrate (neutral)	240 grs.	28 gms.
Water	20 ozs.	1,000 c.c.s.
B.—Potass. ferricyanide	50 grs.	6 gms.
Potass. citrate (neutral)	50 grs.	28 gms.
Water	20 ozs.	1,000 c.c.s.

Use equal parts of each. If prints are pinkish in the high-lights, use more citrate in the A or B solution. This process yields a range of tones from warm black to red chalk on bromide prints, the warmth of tone increasing as the solution acts on the print. The process does not intensify the prints; it is cheap and the results are permanent.

A. C.—It would be a rather long story to answer your question on depth of focus, and, perhaps, it will be satisfactory to you to wait for the appearance of a series of chapters on the subject which we have in type, and which should appear within the next few weeks. From one point of view depth of focus is independent of the focal length of the lens, and depends only on the actual diameter of the lens stop, but that basis does not serve invariably owing to the fact of the limited accommodation of the eye, which makes it necessary for the print taken with a lens of such short focus as 3 inches to be viewed at about the same distance (10 inches) as one taken with a lens of three times the focal length. This property of the eye upsets the doctrine according to which depth depends only on the lens aperture when the circumstances are such that prints from very small negatives are viewed without enlargement. We hope that the articles which are to appear will make clear many of the points which are somewhat obscure in the consideration of depth of focus.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3249. Vol. LXIX. FRIDAY, AUGUST 11, 1922. Price Fourpence.

Contents.

SUMMARY.

In a leading article we refer to a few of the pitfalls into which assistants often fall in applying for situations which they see advertised, and at the same time draw attention to the means they should take in collaboration with our publishers to avoid loss of specimens of their work. (P. 470.)

In a further paper on studio work, Mr. J. Effel deals in a novel manner with the point of view in portraiture, condemning the "full front face," and advocating more artistic treatment. (P. 471.)

One or two of the precautions which require to be observed in the use of toning with "liver of sulphur" are the subject of a paragraph on page 469.

Two simple ways of determining the correction of lenses for chemical focus are described on page 475. It is shown how, when the correction has been found for a particular lens under one set of conditions, the correction under every other condition can be calculated.

In a paragraph on page 469 we explain to what degree it is possible to form an opinion as to whether the copyright in an old photograph has ceased to exist.

Three new sensitisers for the deep red, which have been selected as having interesting properties, are dealt with in a communication from the Eastman Kodak Company's Research Laboratory. Two of the dues—Naphthacyanole and Kryptocyanine—are being placed on the market. (P. 474.)

A hint on economising plates—using sometimes a 15 × 12 cut in halves for long, narrow groups—is given on page 470.

In the use of a camera for copying, a great deal of time and labour may be saved by the provision of a scale, serving to set the camera extension according to the scale upon which an original is to be reproduced. (P. 470.)

In the present issue appears the first of a series of chapters on an old subject in photographic optics, viz., depth of focus. Despite all that has been written, there still exists, we think, some confusion between the two views which have been taken of depth, and therefore it may be useful to explore the first principles of the subject, as is done in the present chapter, and then to show how and why in some circumstances depth may be regarded as dependent only on the actual aperture of the lens stop whilst in other circumstances the focal length of the lens may also be taken into account. (P. 476.)

Where a number of prints are required, and particularly if a suitable artificial light is available, the running off of a batch of print-out prints is practically as expeditiously done as when using development papers. (P. 470.)

The Edinburgh Society of Professional Photographers have decided not to hold the proposed Fair in March next, but are considering whether a Congress and exhibition cannot be held in place of it. (P. 481.)

Customs duties when taking a foreign-made camera to the Continent are explained in a note on page 482.

EX CATHEDRA.

Single Solution Toning. While the tone which can be obtained upon various brands of bromide paper does not vary greatly when properly developed prints are bleached and sulphided in the usual way, a warm sepia being usually obtained, this is not the case when a single solution, such as hypo-alum or liver of sulphur, is employed. With some papers nothing beyond a cool purple, resembling that of a chloride print toned in the usual gold and sulphocyanide bath can be obtained, while others will tone readily to quite a warm or even a yellowish sepia. It is therefore very necessary, when experimenting with "liver" toning, to obtain several samples of paper, so that a suitable one can be chosen. Probably the greatest advantage of the single solution toning is that the process can be arrested at any desired stage from a warm black to a sepia. It should be noted that the rapidity of action and, to a certain extent, the colour is largely dependent upon the temperature of the solution. Some papers also tone much more quickly than others, a tepid solution acting in a reasonable time. In such cases any preliminary hardening becomes unnecessary.

* * *

Has Copyright Expired? The question of the existence of copyright in a photograph of obviously ancient date is one which now and again presents itself to photographers, for example, when an old portrait is brought in to be copied. While it is not always possible to say definitely, from such particulars as a customer may supply, whether copyright has or has not expired, a knowledge of the retrospective effect of the present Act upon the term of copyright created under the previous Act of 1862 will do something towards justifying a fairly reasonable conclusion. It needs to be remembered that, in respect to all works in which copyright subsisted when the present Act came into force on July 1, 1912, the effect of the latter Act is to assign to them a term of copyright of fifty years from the making of the negative. In this respect, therefore, the present Act is a great improvement on the former one, according to which copyright lasted for the life of the owner and seven years after his death. Under the old Act, it was indeed more difficult to ascertain the existence of an old copyright than appears on the surface, since the Courts held that the "author" was the actual person who arranged and took the photographs. Thus, the "author" might be, and often was, an assistant of the photographer whose name appears on the mount. Therefore, from these considerations, the first thing to do in seeking to arrive at an opinion as to whether there is copyright in a photographic portrait is to answer the question: Is it likely that the actual taker of the portrait was alive on July 1, 1905, that is, seven years before the present Act came into force? If it appears improbable that he could have been, then the inference is that copyright had expired

before July 1, 1912. If, on the other hand, it is conceivable that the "author" was alive on July 1, 1905, the existence or non-existence of copyright turns solely on the number of years which have elapsed since the making of the negative. If less than fifty, the copyright is still in existence; if more than fifty, it has expired. In the case of most photographs taken, say, thirty or forty years ago, any decision is little more than a guess.

* * *

Economising Plates. While the present price of plates continues, there is every necessity to avoid exposing the larger sizes wastefully. In many cases this can be done by cutting two plates from the next larger size, which, in the case of many subjects, give the necessary area. Many groups, especially flashlights of dinners, call for a long, narrow plate, a fact which our American friends have recognised by providing cameras to suit. Very often a plate 12 x 7½, or sometimes 15 x 6, will suit the subject; either of these sizes may be made by a single cut from a 15 x 12 plate. There is little difficulty in using these in the ordinary slides, all that is necessary being two strips of glass, one on either side of the plate, to keep it central. To obviate the risk of slipping, a strip of adhesive plaster or insulating tape may be rubbed down along the edges, or even a slip of lantern binding stuck on. If such sizes are taken into general use, a simple grooved carrier may be made, into which the plate may be slipped. With such an arrangement, flat films which are more easily cut can be utilised.

* * *

Printing Out. It has come to our notice that some of the younger generation of photographers, whose experience dates from a time subsequent to the general adoption of developing papers, have been deterred from using any printing-out process by the idea that a great loss of time is involved by so doing. This is undoubtedly the case if only a few negatives have to be dealt with, but if, say, two or three dozen can be handled simultaneously the difference is not serious. In the case of sepia prints, in which, besides developing, bleaching and sulphiding have to be resorted to, there is probably no saving in time as compared with a self-toning collodion paper, while the results are, as a rule, much better. There is, of course, always the uncertainty of the quality of daylight, but if a mercury vapour tube be used, printing-out becomes an easy task, whether self-toning, carbon or platinum paper be used. It is necessary to point out that unless used by reflection, which is expensive, the arc light does not give satisfactory prints, there being a tendency to general flatness. Half-watt lamps have been found altogether too slow for printing purposes.

* * *

A Scale for the Copying Camera. An accessory for the camera with which much copying is done may be made in a few minutes and will be found to save a great deal of time in adjusting the camera extension into position for approximately sharp focus. Assuming that the camera is, as it should be, one of the rear-focussing type, let a strip of wood of length a little more than twice the focal length of the lens, be fixed to the lens-front by one end, the rear end thus projecting beyond the camera back at about the normal extension. Let the camera be focussed on a distant object and a mark made on the wooden strip registering with some definite part of the camera back, such as the front edge of the frame. Let this mark on the strip be called A. Now let some piece of printed matter be sharply focussed, so that it is reproduced same size on the focussing screen, and let a second mark B be made on the strip of wood. It now only remains to divide the space between A and B into, say, sixteen equal parts, and to mark these divisions, 1-16th, 1-8th, 3-16th, etc., on the strip, starting from the point A, in order to obtain a scale which, for the particular lens, indicates the position to which the camera requires to be extended for sharp focus when copying on any of the scales marked, as described above, on the graduated strip. Thus, for reproduction of a 12-inch original as 9 inches in the copy, that is on a scale of three-quarters, the camera back is racked to the three-quarter mark and focus obtained by moving the instrument as a whole nearer to or further from the original.

"IN REPLY TO YOUR ADVERTISEMENT."

In consequence of the considerable number of small advertisements by employers requiring assistants and by assistants requiring employment, which appear week by week in our advertisement pages, we are often called upon to deal with debatable matters arising from those advertisements, and incidentally have frequently the opportunity of seeing the letters which are written to an employer by applicants for a situation. We may, therefore, be rendering some service to assistants if we bring together a few notes, the result of our observations in these affairs.

One of the first things we would do is to caution assistants against sending to employer advertisers who use a Box number specimens of their work or originals of their testimonials. In the past, to our certain knowledge, the readiness of assistants to send specimens of their work to unknown people has been much abused; so much so, that for a number of years past our publishers have declined to insert requests for specimens in advertisements of situations vacant which do not disclose the name and address of the advertiser. Nevertheless, despite the absence of the request, assistants do send their specimens and, therefore, have only themselves to blame if they are unsuccessful in getting them again. There is, of course, no reason to attach suspicion to an advertiser because he employs a Box number. He may have the best of reasons for not wishing to disclose his identity. On the other hand, the use of a Box number is a means which may be used by the unscrupulous for obtaining specimens for the window or showcase. There is a further cause of failure on the part of assistants to obtain recovery of their specimens, and that is one which is scarcely to be ascribed to the evil intentions of the advertiser. It is, that an assistant will omit to mark his name and address on the back of each specimen. He may send half-a-dozen such unmarked specimens with his letter of application, presumably under the happy impression that he is the only applicant. The advertiser, who perhaps has thirty or forty similar letters and batches of specimens in response to his announcement, can hardly be wholly blamed if, in such circumstances, specimens get mixed up, so that they cannot be returned to their proper owners. Another hint about specimens which we may give to assistants is that the prints should be nicely mounted. Many of the specimens which we have seen have been frayed and dirty prints, the state of which greatly detracted from work which, so far as the capacity of the assistant in the studio was concerned, was quite creditable.

As regards the letters which are written in reply to advertisements, let them be of the utmost conciseness, consistent with statement of the required facts. No need to begin with "In reply to your advertisement for a receptionist in Friday's 'British Journal,' I beg to

offer my services." The employer knows all that, and gets tired of reading it as the introduction of thirty or forty letters. Hence he is biassed, to some extent, in favour of the applicant who cuts it out. We are rather inclined to think that the best way of putting one's qualifications before an employer is to write a brief note simply stating the salary required and date when at liberty. Other particulars may be concisely given on a separate sheet, taking care to mark this latter with the name and address of the applicant. It is just as well to make these particulars into separate short paragraphs, each dealing with a separate qualification, *e.g.*, experience in different branches of work, names and addresses of past employers with dates of entry and leaving service. Particulars of the latter kind may with advantage be drawn up in a kind of diary form, showing how and by whom the applicant has been employed in a course of years. Such particulars as these, where the terms of service have been of reasonable length, are evidence of reliability, to which, of course, an employer will attach as much importance as technical efficiency. If assistants who find a difficulty time after time in obtaining even an answer from an employer's advertisement could compare the neatly written and plainly expressed letters of others with their own rambling and almost illegible applications they would obtain some idea of the cause of their ill success.

A few words may be said respecting assistants' advertisements for situations. These, to begin with, should define the special branch of work as definitely as possible, *e.g.*, printer, operator, retoucher. They should also give at least some idea of the geographical position of the assistant. We can well understand that for obvious reasons an assistant often will not wish to name the town in which he or she is situated, but the county or the distance from some large town might be stated, so that an advertiser has some idea of the facility or otherwise with which he can interview an assistant beforehand. Assistants also may at times turn to advantage the fact of being out of employment by offering to take a berth at a minute's notice in response to a letter or telegram. Just now, in the height of the holiday season, there is, no doubt, an opportunity for making a feature of such readiness in advertising for a post.

WITH A PORTRAITIST IN THE STUDIO.

[The following is a further paper of the series by Mr. J. Effel, written with the aim of giving a more intimate kind of instruction in the practice of studio lighting and posing than is perhaps ordinarily attempted in articles of this kind. The two previous papers appeared in the "British Journal" of last week, the first being an introduction to the series and the second dealing with the arrangement of the bust portrait. Further chapters in the series will be published during the next few weeks.]

III.—THE POINT OF VIEW.

If there is one thing more than another that stamps the work of the portraitist as commonplace and uninteresting it is the "full front face" picture. The man who offers the majority of his clients this class of goods has no right to grumble at bad business. To be quite charitable, however, it must be admitted that most of this "looking to the front" photography is produced in the belief that the public prefer those pictures to more ambitious efforts, and not a little because the photographer has not trained his eye to see anything but the obvious.

"Well, but what's wrong with the front face, and isn't it a fact that they ask for that sort of thing?" I hear someone say. Now, it is just to clear up this confusion that I am writing this chapter. Do not lose sight of the fact that I am more concerned with the consideration of the making of *portraits that will sell better* than I am about what might be described as "Photography for High-brows." I am an old studio worker, I have travelled widely and seen most phases of the business. I have intimate knowledge of dealing with the best people, and know how to cater for less intelligent patrons without loss of dignity. You will not find me talking of guineas to the man whose studio is in a purely working-class district and who simply *must* deal in postcards and conduct his business to suit the spending conventions of the wage-earning community. One need not offer red chalk carbons to a glossy bromide public. I do not think sufficient thought has been given to the small man by the leaders in the profession. We all admit that it is very much easier to photograph well-bred, well-dressed persons and children who will respond to our advances, taking reasonable time to the work, than it is to deal with those who, in addition to their awkwardness, are very frequently unable to appreciate beautiful and artistic work. After all, the West End man knows all I have got to teach and has everything in his favour. It is the worker in the middle class or cheaper studios that I am most concerned about "gingering up." Let me say this by way of comfort to the professional whose studio is an unpretentious one in an outlying suburb: there is no other business I know of where the small man can successfully compete with elaborate and central premises so much as in photography. One cannot imagine a lady forsaking the big store for the little draper round the corner, but for something distinctive and personal, such as a photograph, clients who have discrimination will go anywhere.

Probably you are wondering what the foregoing paragraph has to do with the iniquity of photographing sitters looking to the camera, so I'll be more direct and answer your questions. The human face is not a flat surface. I have compared it to a physical geography map. A photograph of the face is a representation on a flat surface of a more or less round object *as seen in monochrome with one eye*. If one could see a perfect face both eyes would be of the same size and shape, one ear would match the other, the nose would be straight and the mouth would not droop at one corner. Now, I think a face like that might be worth taking "full front" to show the regularity of the features, but, considering the limitations of the photographic lens, the nose, the face's most prominent feature, would not be truthfully rendered, unless by very skilful lighting. Assume, however, that we have got a good front face photograph of a perfect face. You will find that if a line were drawn down the centre of the picture, both sides would be exactly alike. Why then, I ask, should we photograph two ears and two eyes from exactly the one point of view, why should we foreshorten a good nose and chin, give but the one line of cheek and neck, and fail to indicate in the slightest degree the shapeliness of the head? There is no answer, unless you tell me that the public ask for photographs "looking straight at the camera." I have had that request nearly every week of my professional life, and, as a picture "that just looks at you" is very popular, I must explain how I reconcile my detestation of the front face with my ideas of giving clients what they like.

Customers only know what they want approximately. They use the terms "side," "front" and "full" to convey their meaning in a general sort of way. The photographer who

could argue with his sitter about the difference between "three-quarter face" and "full face," or, indeed, about any other technicality, would be an ass. When a lady tells me that she doesn't wish to be taken "too near the camera," I do not give her a lecture on the relativity of the focal length of the lens and the dimension of the sensitive plate. I know quite well that what she wants is a comparatively small figure. Not one person in a million would ask for a front face and then grumble if the head were turned slightly, and yet *that slight turn makes a world of difference*.

Let us turn back to the perfect face and the front view portrait of it. I showed that one side is but a repetition of the other and indicated that many beauties were completely hidden. Once, when out walking with my little daughter, I said, "Look over there at the pretty pond with the ducks swimming about." Margaret looked in the direction indicated, but saw neither pond nor ducks. Only when I put my head down to the level of hers did I notice that a small hillock completely hid what I wished her to see. A photograph from the child's standpoint would have shown us the landscape lacking in the interest I got from my slightly elevated position. Exactly so it is with a portrait. If the pond and the ducks

An unusual point of view disclosing a variety of "points"—the good profile, abundant hair, the beautiful curves of neck and arms. Note the simplicity of the scheme.

are worth disclosing, or, to drop the metaphor, if there are hidden beauties just round the corner, the camera or client should be altered to reveal them.

Always appear to gratify the wishes of your clients. If you leave a feeling that you have not taken a lady as she wished it is a certainty that your proofs will be severely criticised. Given a lady who has insisted on a front face, don't, for pity's sake, let her sit down facing the camera and then start turning her away. That will invite an argument right away. My procedure is as follows: "I 'size up" her better side and place the chair either slightly looking to the light or away from it, so that it is impossible for her to be "fair on" to the camera. Then, when the blinds have been arranged a little and my assistant has focussed roughly, I say "Now I must turn your head a little, for, of course, you wish to be taken looking at the front." It is then quite simple to select a pleasing point of view, and, the eyes always looking in advance of the turning, a "looking at you" portrait is perfectly easy. As a matter of fact, all the best portraits with the eyes looking to the front are what is known as "three-quarter" face pictures. Look at the portrait work of the old masters, look at the fine work of leading poster and advertisement artists, and, bearing in mind what I have said, I think you will be surprised at the wonderful variety possible with what would always satisfy the public as "looking to the front" portraiture.

Paradoxical as it may seem, a simple front face portrait calls for more knowledge than a "Rembrandt." It only requires the ability to focus and expose to make a photograph which will look like a schoolboy peering into a sweet-shop window. Something more is required by the public from the photographer who calls himself a "portrait specialist."

In practising selection aim to hide the ugly while showing the beautiful. Keep continually asking yourself, "What should I disclose here, what should I keep out of sight?" Our clients, as a rule, know nothing of Art and cannot give good reasons for their preferences and dislikes. It should be sufficient for us that they *don't* like our work. Nature punishes us for breaking her laws, but whether we have eaten unwisely, neglected our sleep, or carelessly exposed ourselves to cold, *we have to find out* to effect a cure and to guard against a recurrence of the trouble. Regarded superficially, there is but little difference between the front face portrait of an ignorant worker and that of an expert. Yet, put them to the vote of our ordinary customers, and the latter will win hands down. Why? Few will be able to satisfy us on that point beyond saying that there is "a something" about it that compels their preference. After all, it would be an evil day for us if the general public cultivated art criticism. Those who like beauty are far easier to serve than those who have a smattering of the technical side of our business. A well-known musician once put me right on the subject of the public. I had just told him that I was a music lover, but could play no instrument myself. "Then you are a lucky chap" was his unexpected remark, "for you can sit down comfortably and enjoy the art of a good performer—the soul of his music—while I can't help criticising his tone, tempo and technique. I always play to the music lovers, *never* to the musicians in my audiences. After all, old man, we are all members of the public on most subjects. Now, take your art, I'm just in exactly the same position regarding photography as you with music. I admire a picture—well, just because I *do* admire it, while you go nosing around it analysing and picking faults, because you are a confounded professional."

Don't take your portraits to satisfy photographers, but think very hard of pleasing your clients. If you are troubled with frequent re-sittings, or very small orders, it is up to you to find the reason, to find in what particular your work is lacking. Don't waste your breath reviling the public. Allowing for some annoying manifestations of right down stupidity—I have known a few masterpieces to be turned down—the fault is always with us, our work or its presentation. Take the rejected proofs, study them well, and then reconstruct them in your mind. Most likely the sitter told us what failed to please, or the fault may be quite apparent. Quite conceivably, however, you are at a loss to find out what is wrong. In such a case it is evident that the photographer is limited in his knowledge of the infinite variety and possibilities of his art. One who has seen little but front faces for years requires some extra knowledge, to say nothing of courage, to bring himself to look all round his subject for a pleasing point of view.

My reason for placing "the point of view" first in the factors that go to make up a successful portrait is that, like the skeleton to the anatomist, or the drawing to the painter, it is the structure upon which the complete composition is built, determining the general effect. "Yes, that's all very fine about selection," says a young studio assistant, "but now that you have ruled out the front face, what is to guide me and what rules have you for my guidance with all the different faces I have to deal with?" That is exactly the question I wish to answer.

We need not enter into an academic discussion on "What is Beauty?" for the Chinaman, the Kaffir and the Briton have different standards. Even with the white peoples there is considerable diversity of opinion, but it is sufficient for our purpose to mention those "points" about a face which we would all agree were good ones, to consider how to make the most of them in a photograph. A straight nose, large eyes, ears close to the head, regular teeth, abundant hair, rounded cheeks, lofty forehead, are universally admired. If ever you get that combination of features in one client you will scarcely be able to go wrong. But as nature is not often so lavish with her attributes of beauty, you must train yourself to search out the most pleasing aspects of your most difficult subjects.

We have all read poetry about the beauty of eyes, but I have

never read a single stanza praising someone's ears. I know a man has two ears, but I like to lose sight of that fact in most of my photographs. If Mr. Toujours Front-face will, for one week, take every sitter so that only one ear is seen he will see, in his own work, possibilities that could not be illustrated in any better way. In turning the head of a model, what are we looking for? Undoubtedly we should be regarding the outline of the side least shown, noting the contours of forehead, cheek and chin. With most subjects, however plain, these curves are a complete index to the shape of the face, and give the idea of roundness which the front face, with the ears as sentinels, succeeds in destroying. I have always found the second ear an excrescence on a beautiful outline. When it happens to protrude an unlovely lobe out of a chubby face (I only notice this in the negative), I give strict orders to the retoucher to obliterate the offence.

I seem to be approaching an ideal point of view by a process of elimination. This is not a bad method either, for when one has ruthlessly ruled out everything that is crude and inelegant, whatever remains must of necessity contain the artistic element inherent in the subject. The front face has flattened itself out, and I have taken one ear from you. What shall we do with the rest of the face? Remember that your first consideration in the point of view is the outline. Your eye probably needs training in this, as in other respects. It isn't at all satisfactory to pose a subject in the studio and then expose the plate from a foot lower than you saw it with your eyes. In searching for a good outline, do not merely turn the head of the subject. Tilting, ever so slightly, to right or left, backwards or forwards, frequently makes a wonderful difference, and, of course, raising or lowering the camera alters the drawing considerably. If you wish to take a man as if his chin grew out of his chest and his shoulders were hung on to his ears keep your camera very high. Although this style of portrait is acceptable to Arnold Bennett—when produced by Pirie Macdonald—the general public are not educated up to that standard yet. For good lines of chin, neck and shoulders a low camera is essential.

The eyes, nose and mouth are to be considered in conjunction with the outline. Fortunately the eyes may be turned, raised or lowered, but the same cannot be done with the nose, which may also be fortunate. Observe what change can be made in the nose by raising or lowering the chin, and take care when using a low camera that you do not disclose an ugly view of the nostrils. The mouth is invariably too big, and the only way I know of making it appear neater is by the process known to artists as "foreshortening," which I will treat exhaustively later.

A few hints or guiding principles in selection may be useful. Although I am taking the factors in composition seriatim, in practice one does not do that. What is called "posing" cannot be properly considered apart from "lighting," and so on. Well, then, let us think of a very stout man. Turn him well away from the light and seat him so that he cannot lean back. Get all the neck you can with low observation. Turn him so far away that you will get the extreme length of his snub nose without exposing his unshapely profile and double chin unduly. Avoid front light with this type of face. Some photographers adopt exactly the wrong method with this problem. If you fill in the hollows, *either with light or lead pencil*, you get a turnip effect. Use light sparingly and secure every bit of detail in the face. Here I'll give a tip that is worth noting. Ordinarily the lighting carries over the nose and slightly illuminates the cheek bone on the shadow side. With the fat subject keep the lighting abrupt, so that the drawing on the dark cheek is lost. Make a portrait on these lines and the eye of the superficial observer will be deceived. The light part is all that is seen, and the suggestion given that the face is very much less broad than it really is.

Let us now think of the opposite extreme, a thin face with very sharp features. From the tip of the nose to the ears are steep planes that could only be faithfully rendered if taken and viewed stereoscopically. Obviously, then, we have to keep well away from the front view. How much we may turn away is to be determined by what we think of the features. If the face is cadaverous and its owner still young, let in sufficient front light to fill in the hollows. If nose and chin are good Rembrandt lighting may be used with good effect. The broad rule in lighting is: faces with good projections may look *towards* the light, low projections should be turned *from* the light.

The severe profile is very exacting, although very beautiful when one has the right subject. Think of the head and hair in this respect as well as the face. Most men need a lot of instruction on feminine "points." I never have the faintest doubt about the better side of a lady's head, the hair dressing tells me that. And the one she thinks the better is the one she is paying me to photograph. Be very careful with the ladies' hair. Top lighting or fancy effects are apt to suggest greyness.

So far I have only been dealing with the bust portrait. As the new scholar at the Sunday school said, man's chief end is the one with the head on. The same selective process obtains where more of the figure is disclosed. In all compositions seek variety. Don't have meaningless repetitions. One day I had been pointing out to an assistant some faults of his in this respect. A little later I overheard him saying to the dark room lad: "A man has two of everything, but for heaven's sake don't let the boss hear you say so."

J. Eppel.

The Royal Photographic Society's house at 35, Russell Square, W.C.1, is being redecorated, and many alterations are being made in the library, artificial light studio and other rooms. Additional bookcases have been placed in position in the library, and an up-to-date and really useful card index of the Society's store of literature is being prepared.

The £3,000 All-British Competition Awards.—A complete list of awards made in this competition has reached us in the form of a poster attractively printed and specially designed for a photographic dealer's shop window. The list of about four hundred names and addresses is too lengthy to reprint in our columns, but space may be found for the winners of the six first prizes of £100 each. These were: W. Lightbody, Hamilton, N.B.; C. C. Davis, Portsmouth; A. Marshall, Bradford; G. F. Prior, Chingford; S. W. Shore, Finchley; and T. H. Mew, Sunderland. Mr. Prior also won the gold medal. The winner of the first prize (£50) in the Junior Section was A. D. Hitchen, Newcastle. The list is one that should be secured by all dealers. The names and addresses of the dealers who won prizes have also reached us. The cash prizes in each of the classes, 1 to 6, were as follows:—1st, £25; 2nd, £6 5s.; 3rd, £2 10s.; 4th, £1 5s.; and the winners were:—Class 1: 1st, J. Loboar, Hamilton; 2nd, J. C. Thompson, Southsea; 3rd, Godden, Streatham, S.W.; 4th, Thomas and Foster, Poole. Class 2: 1st, J. C. Thompson, Southsea; 2nd, Boots Chemists, Finchley, N.12; 3rd, F. Bannister, New Cross, S.E.14; 4th, Chrystold, Ltd., Bootle. Class 3: 1st, T. C. Bridges and Son, Bradford; 2nd, O. F. Moss, Emmanuel Road, S.W.12; 3rd, H. G. Thompson, Leicester; 4th, T. H. Fleming, Newcastle-on-Tyne. Class 4: 1st, City Sale and Exchange, Liverpool Street Arcade, E.C.2; 2nd, J. Fallowfield, Ltd., Charing Cross Road, W.C.2; 3rd, Ordered direct, no award; 4th, J. C. Phelp and Son, Walthamstow, E.17. Class 5: 1st, Horne's Camera Mart, New Broad Street, E.C.2; 2nd, A. P. Taylor, Eastbourne; 3rd, G. Coverdale's Sons, York; 4th, J. Fallowfield, Ltd., Charing Cross Road, W.C.2. Class 6: 1st, J. Walton, Sunderland; 2nd, Parkes Drug Stores, Holloway Road, N.19; 3rd, J. Baxter and Co., Grangemouth; 4th, Peacock and Co., Sittingbourne. Class 7 (Juniors): 1st (£7 10s.), Mawson and Proctor, Newcastle-on-Tyne; 2nd (£3 15s.), W. Middleton and Ashman, Bath; 3rd (£2 10s.), Mason's Photo Stores, Leeds; 4th (£1 5s.), Nash Kenyon, Southport. The second competition is now in full swing, and special literature concerning it is being published. Full particulars may be had from the Secretary, £3,000 All-British Competition, 4, Oxford Street, London, W.1.

SOME NEW SENSITIZERS FOR THE DEEP RED.

(Communication No. 147 from the Research Laboratory of the Eastman Kodak Company.)

In the course of work extending over a number of years, a great number of new dyes derived from quinoline have been prepared and tested for their sensitizing power. A number of compounds prepared in the course of this investigation have been described in a paper by H. LeB. Gray and G. Wiltekunst on "The 6-Alkyloxyquinaldines."[1] The purpose of the present paper is to describe three of the new sensitizers which have been selected as having interesting properties, two of which it is proposed to place upon the market.

1. *Naphthacyanole* (1,1' *Diethyl Di-β-Naphthcarbocyanine nitrate*).

This dye was prepared as follows:—

A solution of 5 grams of β-Naphthquinaldine ethiodide and 5 grams of quinoline ethiodide in 550 c.c.s. of boiling ethyl alcohol (95 per cent.) was treated with a mixture of 4 c.c.s.

Fig. 1.—Beta-naphtha-cyanole.

formaldehyde (40 per cent.) and 60 c.c.s. of 10 per cent. alcoholic potash. The dye separated out in the form of little green needles, which on account of their insolubility were converted into the nitrate. This was accomplished by suspending a small amount of the dye in glacial acetic acid, (75 c.c.s.), and adding 200 c.c.s. of 10 per cent. nitric acid, allowing the mixture to digest for a time (½ hour), and then filtering off the undissolved crystals. The solution was shaken thoroughly with 1 c.c. of 10 per cent. silver nitrate, and the silver iodide filtered off. The dye was precipitated immediately with ammonium hydroxide and re-crystallised from methyl alcohol.

This dye sensitizes powerfully both when added to the emulsion and when used for bathing ready prepared plates. A spectrum, shown in fig. 1, shows a strong maximum in the deep red at 690 μμ and a sensitizing power for the green appreciably less than that shown by pinacyanol. The dye keeps well, and is quite suitable for use in the place of pinacyanol where the extreme red sensitiveness is an advantage.

2. *Acetaminocyanole* (1,1' *Diethyl-6,6'-Diacetaminocarbocyanine Iodide*).

This dye was prepared as follows:—

A solution of 5 grams 6-acetaminoquinaldine ethiodide and 5 grams quinoline ethiodide in 200 c.c.s. of boiling ethyl alcohol, was treated with a mixture of 20 c.c.s. of sodium ethylate (1 gram sodium in 50 c.c.s. absolute ethyl alcohol) and 5 c.c.s. of formaldehyde. A blue green solution was formed, and green crystals separated on cooling. These were re-crystallised from methyl alcohol.

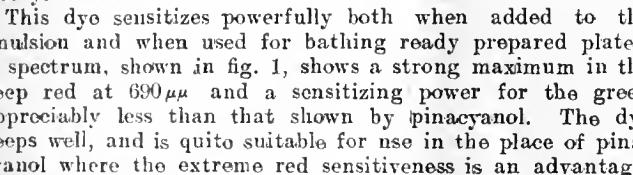


Fig. 2.—Acetamino-cyanole in emulsion.

The dye obtained was found to sensitize powerfully when added to an emulsion giving a maximum at 730 μμ. Its spectrum is shown in fig. 2. When an attempt was made to use this dye in water solution for bathing plates, a very curious result was obtained, the spectrum obtained being that shown in fig. 3, and corresponding obviously to an entirely different dye. Moreover, it was found that in the preparation of the dye, it was necessary to be careful to keep the water content to a minimum, as otherwise the dye had not the characteristic sensitizing maximum at 730 μμ, but gave a result similar to that obtained when bathing plates in water solution. The probable explanation of these anomalies is that the dye is hydrolysed by water, the acetyl radicle being hydrolysed off. While the dye, therefore, has some value when used for emulsions, since the plates prepared appear to keep their characteristic properties, it is not thought that it will be of general value owing to its instability.

A compound is described by Mills and Pope[2], which was prepared by the condensation of 6-acetaminoquinaldine ethiodide

Fig. 3.—Acetamino-cyanole: bathed plate.

and quinoline ethiodide with formaldehyde and alkali, and crystallises in minute green needles. It senstitizes at 6,300-6800 and more weakly at 5200-6300, and thus appears to be an entirely different compound from that described above.

3. *Kryptocyanine.*

This dye was prepared by the condensation of lepidine ethiodide.[3] On re-crystallising from chloroform small bronze crystals are obtained. On trial this proved to be the most remarkable sensitizer yet discovered. A great deal of time was expended in purifying it to prevent a fogging action on the emulsion, since, when tested in the usual concentration, 1 in 25,000, it gave severe fog, though sensitizing with great power with a maximum of 760 μμ. It was found, however, that the dye was being used in far too great a concentration, and by the use of only 1-20th of the amount required for pinacyanol excellent results were obtained. The spectrum is shown in fig. 4. For bathing solutions a concentration of 1 in 500,000 is recommended. The addition of either ammonia or alcohol was found to be a disadvantage.

Tests were made for the extension of the spectrum with kryptocyanine into the extreme infra red. It was found that although its maximum is at a considerably longer wave-length than that given by dicyanine, and although up to 850 μμ its sensitizing power is greater than that of dicyanine, yet

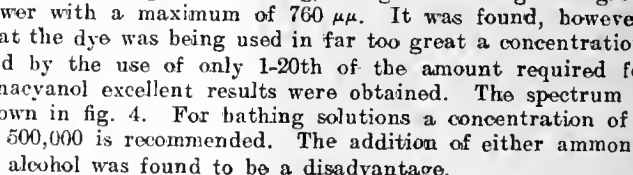


Fig. 4.—Kryptocyanine.

beyond this point dicyanine shows a greater sensitizing power, and above 900μμ Kryptocyanine is almost useless, while dicyanine employed according to the directions given by Dr. Meggers is still effective. Nevertheless, Kryptocyanine represents a very great advance in the preparation of photographic materials sensitive to the extreme red. Since it confers no green sensitiveness, and, indeed, the materials sensitized with it have very little sensitiveness below 680 μμ, infra

1. Forthcoming in Jour. Amer. Chem. Soc.

2. "Phot. J.," 40. p. 253 (1920).

3. "The Kryptocyanines, a New Series of Photo-Sensitizing Dyes," by E. Q. Adams and H. L. Haller, Jour. Amer. Chem. Soc., 1920, vol. 42, p. 2661.

red effects in ordinary photography can be obtained by the use of a strong yellow filter only, and employed in this way, it is possible to give very short exposures, one second at *f*/8 being quite satisfactory in bright sunlight. The results obtained are those characteristic of photography in the infra red, blue skies appearing dark, and green foliage very bright, so that a tree covered with spring leaves appears as if in blossom, and the grass on the ground as if it were snow.

It is probable that the dye will have applications in astronomy. At the present time, stars are classified by their colour index, this being the relation of the photographic magnitude determined in the violet to the photo-visual magnitude determined in the yellow-green, and determination of the extreme red magnitude at 770 $\mu\mu$ by the use of Kryptocyanine will probably extend the value of such studies. Undoubtedly numerous other applications will be found for this dye.

The Naphthacyanole and the Kryptocyanine will be added to the list of synthetic organic chemicals supplied by the Research Laboratory of the Eastman Kodak Company.

C. E. K. Mees.
G. Gutekunst.

THE CORRECTION OF LENSES FOR CHEMICAL FOCUS.

Many photographers probably possess a lens which gives satisfactory definition in ordinary use, but which will not make sharp enlargements, owing, generally, to what is called "chemical focus," i.e., the focus of the lens for the "chemical" rays which affect the sensitive emulsion does not coincide with the focus for visual rays by means of which the focussing was made. This is often the case with old lenses, particularly R.R.'s and portrait lenses and some of the earlier anastigmats. In the old days when enlargements were made by the light of oil and gas lamps, which was not rich in ultra-violet rays and often possessed a reddish or yellowish tinge to the eye, the optician brought the focus for the red and blue rays into coincidence. Nowadays, with the more efficient mercury vapour and arc lamps, which are rich in ultra-violet rays, correction for the lens has to be made for the yellow and ultra-violet rays. Consequently, some correction has to be applied to the old lens if sharp enlargements are to be made. The amount of this correction will vary with the type of lens, focal length and degree of enlargement. It will be shown in this article how, when the correction has been found for a particular lens under one set of conditions, the correction under every other condition can be calculated.

There are two simple ways of determining the correction; the first is to focus an enlargement sharply by the eye, mark the position of the lens, measure the distance and size of object and image, and then slightly shift the lens and test the focus on a piece of bromide paper. A few trials should furnish the correct position of the lens for sharpest focus pretty accurately. In general the lens will require to be moved towards the enlargement. The amount and direction of the displacement of the lens from its first position should now be measured.

Let u_1 and v_1 (fig. 1) be the distances of enlargement and copy respectively from the lens, of focal length f_1, and m_1 the magnification. These

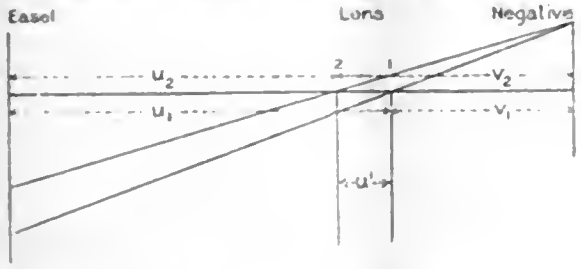


Fig. 1.

all refer to the visual adjustment; let the same letters with suffix 2 refer to the photographic adjustment, and let $u_2 = u_1 + u'$, etc. Then we have from the usual formulæ:

$$u_1 = (1 + m_1) f_1 \qquad u_2 = (1 + m_1 + m') (f_1 + f')$$
$$v_1 = (1 + 1/m_1) f_1 \qquad v_2 = (1 + 1/(m_1 + m')) (f_1 + f')$$

and as nothing has been moved but the lens $u_1 + v_1 = u_2 + v_2$, so

$$f_1 (2 + m_1 + 1/m_1) = (f_1 + f') (2 + m_1 + m' + \frac{1}{m_1 + m'})$$

$$\text{or } f_1 \left(1/m_1 - 1/(m_1 + m')\right) = f_1 m' + f' \left(2 + m_1 + m' + 1/(m_1 + m')\right)$$

Now all the quantities denoted with a dash are small compared with the same quantities with suffixes, being in the nature of correction terms, hence a sufficient accuracy will be obtained if we neglect products of two small quantities, so we may write:

$$f_1 \frac{m'}{m_1^2} = f_1 m' + f' (2 + m_1 + 1/m_1)$$

or:

$$m' = -\frac{f'}{f_1} \cdot \frac{2 + m_1 + 1/m_1}{1 - 1/m_1^2}$$
$$= -\frac{f_1'}{f_1} \cdot \frac{(m_1 + 1) m_1}{m_1 - 1}$$

and: $u' = u_2 - u_1 = m' f_1 + (1 + m_1) f'$

$$= -f' \cdot \frac{m_1 + 1}{m_1 - 1} \quad . \quad . \quad . \quad (i)$$

Now u' has been measured, so that we find the error in the focal length:

$$f' = -\frac{m_1 - 1}{m_1 + 1} \cdot u' \quad . \quad . \quad . \quad (ii)$$

If the lens is to be used at any other magnification or enlargement M, the formula (i) tells us the amount of correction to be applied to u_1, i.e., the distance the lens has to be moved after focussing, viz.:

$$f_1' \cdot \frac{M - 1}{M} \cdot u' = \frac{m_1 - 1}{m_1 + 1} \cdot \frac{M + 1}{M - 1} \cdot \quad (iii)$$

Note as to the sign. If u' comes out to be negative, it means that the lens must be moved nearer to the enlargement. In this case f' is positive, i.e., the lens has a longer focus for the chemical rays than for the visual, or, in the language of the optician, is "over corrected." Such will usually be the case.

A second method of measuring the focal error is more direct if a little more troublesome. For this a test object (fig. 2) must be prepared, consisting of lines ruled in two directions mutually at right angles, with regularly spaced lines, say, a tenth of an inch apart. It may be prepared in several ways: A clean piece of glass may be blackened with varnish mixed with lamp-black, or a plate may be fogged, developed, fixed, washed and dried; the lines can be cut with a sharp knife. Or an unexposed plate may be fixed, cleaned and dried, and the lines ruled on the clear gelatine film. The lines should be ruled parallel to the edges of the plate and one of the central lines, which will be horizontal in the enlarger, should be distinguished by making it double, or in any other convenient way. It will also be convenient to mark the upper part of the plate. The paper on the easel should be tilted, preferably at 45 deg., to simplify calculations, to the lens axis. If now the central horizontal line of the test object is focussed sharply on the inclined screen and the exposure made on bromide paper, it will be found, if the lens has chemical focus, that the central line is not sharp, but some other line is. Suppose, e.g., that the second line from the centre is sharpest, there is then an error in focus of .2 in., multiplied by the enlargement, which is found from the space between the vertical lines on the enlargement. If this is, say, .3 in., the magnification is x3, and so the full error in focussing is .6 in. To find the correction for any other magnification a different formula is necessary.

With the same notation as before,

$$v_1 = f_1 (1 + 1/m_1)$$
$$v_2 = (f_1 + f') (1 + 1/(m_1 + m'))$$

Here $v_2 = v_1$, so

$$f_1 (1/m_1 - 1/(m_1 + m^1)) = f^1 (1 + 1/(m_1 + m^1)).$$

With the same agreement as to approximation as before, this gives:

$$1 \cdot \frac{m^1}{m^2} \quad f^1 \cdot (1 + 1/m)$$

or:

$$m^1 \quad \frac{f^1}{f_1} \quad . \quad m(m+1) \quad . \quad . \quad . \quad (iii)$$

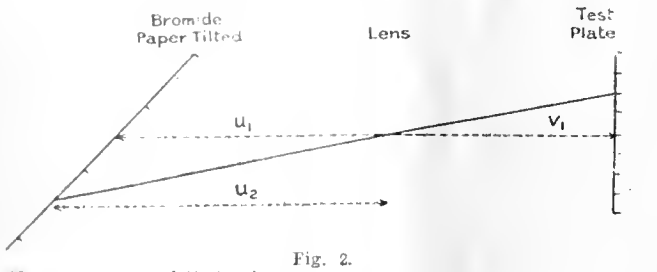


Fig. 2.

Now: $u = f(1 + m)$

$u + x = (f + f^1)(1 + m + m^1)$

where x is the "error in focus" found as above:

Subtracting, $x = f m^1 + f^1 (1 + m)$

Substituting for m^1 from (iii)

$$x = f^1 (m+1)^2$$

$$\text{or } f^1 = \frac{x}{(m+1)^2} \quad . \quad . \quad . \quad (iv)$$

the error in focal length.

For any other degree of enlargement, the correction for u is:

$$\frac{x}{(m+1)^2} \cdot \frac{M-1}{M+1} \quad . \quad . \quad . \quad (v)$$

The figure indicates the direction in which x, and therefore f, are reckoned positive ("over corrected").

Formula (iv) also indicates the adjustment to be made if the easel is moved to get correct focus, viz.:

$$\frac{x}{(m+1)^2} \cdot (M+1)^2 \quad . \quad . \quad . \quad (vi)$$

$$\text{or } -u^1 \cdot \frac{m-1}{m+1} \cdot (M+1)^2 \quad . \quad . \quad (vii)$$

according as x or u^1 is the quantity measured.

(iii) and (v) give the correction to be applied to the *lens* position, (vi) and (vii) the correction to the *easel* position. Either one or other may be used, not both simultaneously. To avoid all trouble about signs, it will be observed that the direction of the movement of adjustment, whether of lens or easel, is always the same direction, whatever the magnification.

It may also be necessary to mention that the front of the lens should always be turned towards the enlargement if the best possible definition the lens will yield is to be obtained.

H. L.

THEORY AND PRACTICE OF DEPTH OF FOCUS.

I

[The rules and formulæ relating to depth of focus have perhaps been the subject of a greater number of articles in the photographic Press for many years past than any other section of photographic optics; and certainly no question concerning the use of a lens has aroused so much controversy. In the present series of chapters the endeavour will be to put before the student an exposition of depth of focus based on first principles, and in terms of geometrical construction within the image space. Much of the confusion which exists in the literature of depth of focus arises from the mixture of two views on the subject. In most English writings depth is treated from the standpoint according to which a certain definite circle of confusion is adopted as permissible in photographic negatives or prints, large or small, which are to be regarded as sharp. On the other hand, among Continental writers it is generally held that the permissible disc of confusion is variable, according to the size of the photograph, or rather according to the distance from which it is to be viewed. There is nothing inconsistent between the two standpoints. Both have their advantages, and as will be seen from the present chapter and from a later one dealing with depth according to the more modern Continental view, both have their limitations for practical purposes. It will be seen that formulæ in accordance with the adoption of a variable disc of confusion may be directly derived from those worked out for a chosen diameter of disc. In this first chapter the phenomena of vision, consideration of which has not received the attention they deserve by English writers, are chiefly dealt with. Chapter II. will deal with the formulæ and practical significance of hyperfocal distance.]

In depth of focus we have a branch of photographic optics which has its obvious practical importance yet cannot be treated by rigid optical formulæ, since it is based on standards which in turn depend upon the acuteness of vision of the human eye and also upon the distances from which prints and enlargements are viewed. Thus, apart from the differences between the eyes of different observers, the purpose for which a photograph is required has to be taken into consideration. Plainly, the same rules cannot be employed for determining the permissible amount of unsharpness in a photograph (even though it may be a large one) which is to be closely scrutinised for its rendering of detail, as for one which is to be viewed from a distance suitable for appreciating its general effect and perspective. For this reason it is necessary to consider the conditions of viewing as much as those prevailing in the taking of the negative when seeking to determine the rules which can be adopted as a guide to the production of adequate sharpness of definition.

The subject divides itself into two parts, the first of which will be dismissed very much more shortly than the second. The first, which we call *depth of definition*, relates to the distance which the focussing screen or plate receiving a sharp image can be moved towards or away from the lens without exceeding the limit of permissible unsharpness. This depth, which is not of much importance in practice, is always a small distance, i.e., ranges from a fraction of an inch to a few inches.

The second part relates to distances in the subject photographed, that is, the distance which can exist between an object and one further from the camera whilst obtaining both in sufficiently sharp focus. The space between points at these distances is what is commonly understood by *depth of focus* (*depth of field* is a better term, sometimes used), and under the conditions of ordinary photography is large, ranging from a few feet to many yards.

Before dealing with these two aspects of the subject, it is necessary to consider briefly certain properties of the eye which are exhibited in the viewing of objects or of flat representations of them, e.g., photographic prints or enlargements.

Sharpness of Vision.

It is a familiar fact that the eye is unable to distinguish the form of a small object at a distance which is very great relatively to the size of the object. A shilling, which measures just under 1 in., if viewed from a distance of about 100 yds. is not recognisable as a circular disc, but appears to the average eye as a point. Thus we can imagine that at a distance of 100 yds. a painting composed of 1-in. discs of colour would appear to lose its disc structure owing to the separate discs becoming unrecognisable at this distance.

Fig. 1 illustrates this phenomenon of vision. It is a half-tone reproduction of a photograph made with a screen of ruling which yields blocks chiefly composed of dots of diameter about 1-16th of an inch. Looked at from the customary viewing distance of about 12 in. the reproduction is so broken up by the dot structure as scarcely to

disclose the subject. But if viewed from the distance of a few feet—about 12 ft., i.e., 2,000 times the diameter of the white dots—the dots cease to be recognisable as such and the details in the prints, so to speak, "join up" to a surprising degree.

Now the image formed by a photographic lens of a subject containing parts at different distances from the camera, bears a certain resemblance to these half-tone proofs, unless a very small stop is used. The lens, as we know, can bring to a sharp point focus only pencils of rays from an object at some one distance. Pencils from nearer or more distant objects are brought to a focus respectively behind or in front of the point image of the object focussed, so that the whole image, on a reduced scale, exists in space. The image obtained on the focussing screen is a cross section of this image, and hence the points of the subject nearer or further than the object focussed are represented photographically by the discs which result from the interception (by the focussing screen) of

Fig. 1. Illustrating limited sharpness of vision.

The discs forming the half-tone reproduction are about 1-16th of an inch in diameter, and at a distance of about 12 ft. cease to be recognisable.

convergent or divergent pencils or cones of rays whose meeting points or foci are respectively behind or in front of the screen.

Just as in the case of our half-tone proofs, a photograph is sharp if these discs are unrecognisable by the eye. This requires that the photograph shall be viewed at a distance which is great relatively to the size of the discs; or, the other way about, that the discs be small relatively to the distance at which the photograph is viewed. In other words, the appearance of sharpness in a photograph is dependent on the limited sharpness of vision of the eye.

According to the physiologists, this limited sharpness of vision is explained by the size of the minute cones which form the sensitive system in the retina. If an object is so remote or so small that its image formed by the lens of the eye falls wholly within the area of one of these cones, there can be no delineation (by the mechanism of the eye) of the form of the object. It is found that this is the case when an object is viewed from a distance equal to or greater than about 3,400 times the greatest dimension of the object. At this relative distance lines drawn from each end of an object to meet in the eye include the very small angle of 1′ (the 5,400th part of a right-angle). The angle requires to be at least 5′ in order that the object shall be sharply perceived. Hence objects which subtend angles at the eye from 1′ to about 4′ are perceived more or less indistinctly, which explains the paradoxical truth that it is the limited ability of the eye to see sharply which causes a broken up image (e.g., containing optical discs of confusion) to appear sharp.

In most of the writings on depth of focus a disc of confusion of 1-100th of an inch (sometimes 1-200th or 1-250th) is taken as the maximum permissible. These correspond with angles of about 3′ and 1′, if the photograph is viewed from a distance of 12 in., and, roughly speaking, correspond with fair and critical sharpness. But it follows from the property of the eye which we have just described that the value admitted for the maximum disc of confusion should vary according to the viewing distance, so that the angle subtended at the eye may be kept within the permissible limits.

NOTE.—For purposes of calculation, the arbitrary method of measuring angles in degrees, minutes and seconds cannot be conveniently used. It is necessary to express the size of the angle by the arc method (the so-called "circular measure"), according to which the measure of the angle is the part of the circumference of the circle included between two radii of the circle (when these radii include the angle at the centre)

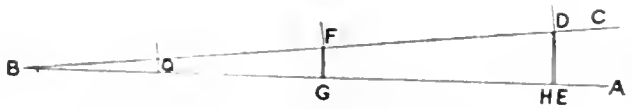


Fig. 2.—Illustrating arc or circular measure of an angle.

The ratio of any arc $D E$ (or $F G$) to the corresponding radius $B E$ (or $B G$) is the arc measure of the angle $A B C$. The angle Q in the figure is 5°. It will therefore be clear that in the case of such small angles as 5′ (one-sixtieth of that shown) the line $D H$ practically coincides with the arc $D E$.

divided by the radius. Fig. 2 illustrates the circular measure of the angle Q, included between the lines $A B$ and $C B$. If from B, as centre, the arc $D E$ is drawn, then the circular measure of the angle Q is the ratio of the arc $D E$ to the radius $B E$. In like manner it is equally the ratio $\frac{F G}{B G}$ where $F G$ is the arc of a circle, also having its centre at B.

If the angle Q is very small its size expressed in circular measure is practically the same as the so-called trigonometrical ratio, the tangent of the angle, that is, the ratio of the perpendicular to the base in a right-angled triangle. This is also illustrated in fig. 2, where $D H$ has been drawn perpendicular to $B A$. The ratio $D H : B H$ is then the tangent of the angle Q. In the drawing it will be seen that the perpendicular $D H$ differs slightly in length from the arc $D E$, and that the base $B H$ is very slightly less than the radius $B E$. The tangent of an angle is practically equal to the circular measure of an angle in the case of angles less than 5 deg. As the angles concerned in sharpness of vision are much smaller still, viz., from 1′ to 4′, the tangent may be considered equal to the circular measure: the values of the former (the so-called "natural tangents") may be taken from tables of logarithms, etc., such as "Chambers' Mathematical Tables." It will thus be clear that the measure of such very small angles is simply the dimension of the object divided by its distance, a relation which requires to be kept in mind in considering the depth formulæ to be given

Limited Accommodation of the Eye.

The second property of the eye which is directly related to depth of focus is its limited power of accommodation in viewing very near objects. Putting aside defects of vision, such as short-sightedness, the normal eye has extraordinary powers of adjusting the focal length of its fluid lens to objects at distances beyond a certain minimum, but in the case of the average adult, the nearest distance at which an object can be comfortably and distinctly viewed is from 10 in. to 14 in. This distance becomes greater from 50 years of age onwards, beyond which age the normal distance (which we may take as 12 in.) is preserved by the wearing of suitable spectacles. This limit of nearness for distinct vision is of importance in depth of focus, since it follows that both the very smallest photographs and larger ones, up to about 10 in. × 8 in., are necessarily held at the same distance of about 12 in. from the eye for comfortable viewing. Hence it follows that a 10 in. × 8 in. enlargement from a small negative requires to be of as fine optical definition as a contact print from the negative. On the other hand, in the case of enlargements from negatives of fair size themselves, it is almost always the case that they are viewed from distances proportional to their size, and hence may be of correspondingly coarser optical definition without apparent loss in sharpness.

We may now set down in the form of a table the sizes of the discs which appear as points (sharp definition) when viewed from the two selected distances of 12 in. and 30 in., and also of discs which represent lesser but still reasonable sharpness when viewed from these same distances, at larger angles 1′ 12″ to 4′.

TABLE I.

Angle subtended by disc of confusion.		Tangent * of angle	Circle of confusion indistinguishable	
Minutes and seconds.	Circular measure.		at 12 in.	at 30 in.
1′	$\frac{1}{3438}$ = .00029	.00029	$\frac{1}{286}$	$\frac{1}{114}$
1′–8″	$\frac{1}{3000}$ = .00033	.00033	$\frac{1}{250}$	$\frac{1}{100}$
1′–42″	$\frac{1}{2000}$ = .00050	.0005	$\frac{1}{166}$	$\frac{1}{66}$
2′	$\frac{1}{1724}$ = .00058	.00058	$\frac{1}{144}$	$\frac{1}{58}$
2′–51″	$\frac{1}{1200}$ = .00083	.00083	$\frac{1}{100}$	$\frac{1}{40}$
3′	$\frac{1}{1149}$ = .00087	.00087	$\frac{1}{96}$	$\frac{1}{38}$
3′–26″	$\frac{1}{1000}$ = .001	.001	$\frac{1}{83}$	$\frac{1}{33}$
4′	$\frac{1}{862}$ = .00116	.00116	$\frac{1}{72}$	$\frac{1}{28}$

* = size of object (i.e., disc of confusion) divided by its distance from eye.

From the above brief consideration of the limitations of average human vision, we can now turn to the rules which respectively apply to depth of definition and depth of focus, using these terms in the senses already defined.

Depth of Definition.

The formula for the distance through which the focussing screen may be moved without exceeding a given standard of sharpness of definition in the case of a flat object may be obtained from the following construction. In fig. 3 the image of a point O is formed at F at a distance v

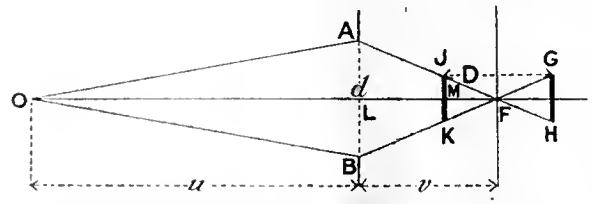


Fig. 3.—Illustrating depth of definition.

If a point image of a point O in a *flat* object is formed at F, and if the admissible disc of confusion is c, the focussing screen may be anywhere within the distance D = depth of definition.

from the lens diaphragm $A\,B$ of diameter d (strictly from the exit node of the lens). Let $G\,H$ and $J\,K$ be positions of the focussing screen in which the point image becomes a disc of the largest admissible diameter, c. The distance D is the depth of definition: and it is clear from the construction that the depth extends equally on each side of the focus F.

From the construction

$$\frac{A\,B}{J\,K} = \frac{L\,F}{M\,F}$$

$$\text{that is } \frac{d}{c} = \frac{v}{\frac{D}{2}}$$

$$\text{Therefore } \frac{D}{2} = \frac{c \times v}{d}$$

$$\text{and } D = \frac{2c \times v}{d} \quad . \quad . \quad . \quad . \quad (1)$$

If the object O is at a great distance relatively to the focal length of the lens, the image is formed at a distance f equal to the focal length of the lens so that formula (1) becomes:

$$D = \frac{2c \times f}{d}$$

Since f/d is the ratio representing the F No. of the lens

$$D = 2c \times \text{the } F \text{ No.} \quad . \quad . \quad . \quad . \quad . \quad . \quad (2)$$

which shows that the depth of definition is the same for every lens having the same F No., and is independent of the focal length. It varies with the standard adopted for permissible unsharpness.

For example, adopting a disc of confusion of 1-100th of an inch, the depth of definition with an $f/4.5$ lens is

$$2 \times \frac{1}{100} \times 4.5 = .09 \text{ in.}$$

If the image is larger than the object, as in copying-enlarging, the depth is greater, since in this case v in formula (1) becomes equal to $f + Rf = f(R + 1)$ where R is the number of times of enlargement. Hence

$$D = \frac{2c \times f(R+1)}{d} = 2c \times (R+1) \times F\,\text{No.} \quad . \quad . \quad (3)$$

For example, adopting a disc of confusion of 1-100th of an inch when copying-enlarging nine times with an $f/4.5$ lens, the depth of definition is

$$2 \times \frac{1}{100} \times 10 \times 4.5 = .9 \text{ in.}$$

The considerations already set forth in respect to the relation of the value of the permissible disc of confusion to the viewing distance and also to the required standard of sharpness will have shown the value of c to be employed in the above formulæ. For example, for prints to be examined for detail from the average viewing distance of 12 in., the maximum value of c is about 1-250th of an inch, whilst for the same standard of sharpness in, say, a 20 in. × 16 in. enlargement to be viewed not nearer than 2 ft., c may be twice as great, say, 1-120th of an inch. For less critical degrees of sharpness, correspondingly greater values of c may be employed, as shown in Table I.

It must be repeated that the formulæ above given apply only to a flat object, as in copying a drawing or enlarging a negative. Moreover, they apply strictly to images formed on or near the lens axis, but, providing the lens is free from curvature of field, may be regarded as holding good over the angles covered by lenses in ordinary photographic work. G. E. B.

(To be continued.)

FORTHCOMING EXHIBITIONS.

August 26 to September 9.—Toronto Camera Club. Secretary, J. H. Mackay, Toronto Camera Club, 2, Gould Street, Toronto, Canada.

September 9 to October 7.—London Salon of Photography. Latest date for entries, August 30. Particulars from the Hon. Secretary, London Salon of Photography, 5a, Pall Mall East, London, S.W.1.

September 11 to 15.—Professional Photographers' Association, Princes Galleries, Piccadilly, London, W. (Trade and Professional). Hon. Secretary, Richard N. Speaight, 157, New Bond Street, London, W.1. Also foreign invitation loan exhibition of professional portraiture. Hon. Secretary, Marcus Adams, 43, Dover Street, London, W.1. Latest day for entries and exhibits, August 31.

September 18 to October 28.—Royal Photographic Society Annual Exhibition. Latest date for entries, August 25 (carrier); August 26 (hand). Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

October 18 to 28.—Portsmouth Camera Club. Latest dates: Entry forms, October 11; exhibits, October 16. Particulars from the Hon. Secretary, C. C. Davies, 25, Stubbington Avenue, North End, Portsmouth.

A HYDRAULIC AGITATOR AND SOLUTIONER.

A NOTE IN THE "PHOTOGRAPHIC JOURNAL."

THE apparatus described in the following note was evolved to meet laboratory demands for a simple stirring device. When liquids have to be kept in continuous agitation it is customary to use a small motor, with shafting and pulley wheels, to actuate a propeller or bent rod immersed in the liquid. This is an expensive and comparatively complicated way of doing the work, as often as not the propeller breaks the beaker or thermometer, and it cannot be used with narrow-necked vessels.

Referring to the diagram, fig. 1 shows a simple water pump, which, used in conjunction with the bulbs (R, S. T) of figs. 2, 3 and 4, has a variety of applications. The bulb (A) is fitted with a syphon (BK), a water inlet (H), an attachment tube (O), and two narrow U-tubes (CE) and (DF). In normal use for agitating liquids and suspensions in bottles, flasks, or beakers, the bulb attachment in fig. 2 is connected by a rubber tube with tube (O) of fig. 1. The tube (DF) is corked at (F). Water admitted at (H) rises in (A), displacing the air through tube (CE). When (A) is full, the water runs into (CE), sealing it, and also flows over the top bend of the syphon tube (BK). It now flows down the limb (K), which is in such a diameter that the water passes away faster than it is supplied at (H). In so doing it creates a partial vacuum in (A) which is relieved by a flow of air from (R), with the result that the liquid to be stirred rises in (R). When it reaches the constriction (S), the sudden check prevents air flowing to (A) and the momentum of the water column in (BK) momentarily increases the vacuum, so that the water in (CE) is sucked into (A), leaving the bulb open

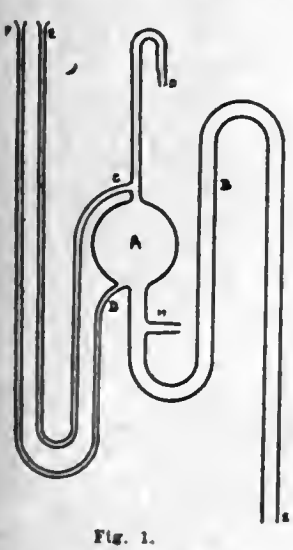


Fig. 1.

Fig. 2.

Fig. 3.

to the atmosphere once more. Air enters rapidly, breaking the water column in (BK) and allows the water in (R) to flow back into the reaction vessel. The cycle is then repeated.

The removal of the liquid from the reaction vessel has been objected to on certain grounds, and to meet the demand for an attachment to stir the liquid *in situ* the bulb in fig. 3 has been devised. The bulb is connected by (P') to (O), as above, and the cork moved from tube (CE) to (DF). Admission of water at once seals (DF), compressing the air in (A) and driving liquid through the holes in the base of (R') into the beaker. The syphon action then comes into play, emptying (A) and refilling (R') with solution. The tube (FD) is cleared when (R') is full, and the cycle repeats.

It will be seen that such a device, capable of delivering a series of air compressions and rarefactions, can be of great use to photographers. The tube (O) can be connected to a rubber bladder and the expansions used to rock a dish. The bulb attachment can be used to stir hypo and toning baths, as in fig. 4, a method greatly preferable to dish rocking.

To a photographer the most important application is for dissolving chemicals. For making up developers, dissolving hypo, metabisulphite, sulphite, etc., the device is invaluable. The chemicals are placed, with the requisite water, in their bottle, the solutioner (fig. 2) inserted in the top, and in a few minutes everything is dissolved. Developers can be made up rapidly without shaking or the use of hot water.

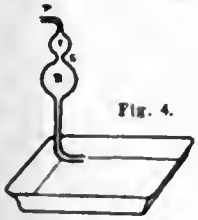


Fig. 4.

The apparatus can be constructed from glass and wood, cheaply and conveniently, and requires little water to actuate it. A patent has been applied for, and it is hoped to find many other applications for the device.

K. C. D. HICKMAN, B Sc.

Photo-Mechanical Notes.

Contact Reproductions by Reflected Light.

FURTHER details of the Manul process are disclosed in the patent (No. 156,692) taken out by Max Ullmann, and supplement those which were published in the "B.J.," of October 28, 1921 (page 645), and in the "B.J.," of July 14 last (page 420.) The new specification states that the invention relates to the manufacture of printing plates according to the process described in patent specification, No. 24,607, of 1913 ("B.J.," September 18, 1914, page 714), in which a negative film on a translucent plate is placed in direct contact with the opaque original and exposed through the translucent plate, the image therein being then transferred to the printing plate in the usual manner. When it has been desired to print an edition, from an ordinary litho-press or from a zinc rotary press, it has been necessary to interpose a counter-transfer printing in order to enable the illustrations or letterpress to appear reversed. Owing to this transfer printing and counter-transfer printing, the originals that are to be duplicated lose considerably in sharpness of definition.

The new invention renders it possible to produce negatives in such a manner that they can be used in the production of printing plates without transfer printing, both on the litho-machine plate and the offset press. It consists in a process for the manufacture of negatives from opaque originals, for the purpose of producing printing plates for photo-lithography, according to the British patent specification named (No. 24,607, of 1913), characterised by the feature that the dyed chromate-colloid film is bedded between transparent thin films, one of which allows the negative to be stripped from its support, and the other provides a protective coating. In carrying out the process the chromated colloid film, which has a thickness far below $\frac{1}{1000}$ m.m. is placed upon a plate which is first provided with a coating that will enable the film to be subsequently stripped off. After developing by washing out the unexposed parts and rendering opaque to light the film that has remained on the plate, the film is given a coating of gelatine poured on to its upper side, and after it has been dried, the film is separated from its support. The stripped film or negative is then used for preparing the printing surface.

The following advantages are claimed for the process:—

(1) It is possible to work without printing on to transfer printing paper and subsequent transfer printing on to the offset machine plate. The negative can be copied directly on to the machine plate with the help of the drawn-off negative. (2) By reason of the absence of the glass plate as a film support, it is possible to use the stripped negative right and left for copying, so that it is possible to copy the picture or the reverse picture as desired by means of the machine plate, that is to say, the negative can be used both on the offset printing press and on the direct printing plate or litho-stone.

The method of carrying out the invention is as follows:—Two glass plates are placed one on top of the other with the sides intended to receive the poured on coatings outermost, and they are pressed together by means of clamps. The plates are then dipped with their four edges into a rubber solution, so that a rubber border 0.25 cm. wide, is formed on each plate, and the edge surfaces of the two glass plates are coated with a fine film of rubber. The double plate is then dipped completely into beeswax dissolved in carbon tetrachloride. The double plate is thereby covered with a smooth perfectly clear film of wax. The dried double plate is next dipped into a vessel containing 3 per cent. collodion and a few drops of castor-oil, and placed upright to dry. After the drying the plates are separated, and a solution of chromate colloid poured upon them. The further treatment is the same as that of the simple glass plate having no coating to allow stripping the film negative as described in the patent specification already referred to. After the drying of the negative there is applied to the upper side a poured-on coating of an aqueous solution of gelatine containing a few drops of glycerine. After the pouring on has been effected, the glass plate is placed upon a cold foundation, and the gelatine is caused to dry rapidly. The drying is effected by means of warm air. The nega-

tives may be retouched in the dry state unless it is preferred to do the retouching on the metal plate. Then the film is cut through along the rubber borders, and the negative is drawn-off the glass plate and then cut to the proper size.

The following patents have been applied for :—

OFFSET PRINTING.—No. 20,698. Process for making printing plates for offset or lithographic printing, etc. C. Winkler.

COPYING PROCESS.—No. 20,699. Copying process for making printing plates. C. Winkler.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, July 24 to 29 :—

PRINTING APPARATUS.—No. 20,191. Photographic printing apparatus. H. R. Eason.

FILMS.—No. 20,373. Photographic films. E. C. V. Miller.

TELESCOPIC ATTACHMENTS.—No. 20,542. Telescopic attachments for hand-cameras. A. Warmisham.

STEREOSCOPY.—No. 20,346. Means for obtaining stereoscopic pictures. E. H. Wright.

CINEMATOGRAPHY.—No. 20,444. Manufacture of non-inflammable films for cinematographs, etc. F. G. Edbrook and F. Edwards.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

FILM DEVELOPING APPARATUS.—No. 154,212 (November 22, 1920).—A rectangular vessel 1 is subdivided by one or more partitions such as 2 to form separate receptacles 3—4 to contain respectively developing solution and water, and if desired an additional receptacle may be provided so that the film may be passed through two developing solutions of different strengths.

At opposite ends of the tank near the top means are provided for conveniently attaching for rotation the film spool 5 and the transfer spool 6.

A short stud 7 is fixed on the wall and engages the usual axial recess 8 in one end of the spool whilst the other end of the spool is attached to the end of a crank shaft 9 which

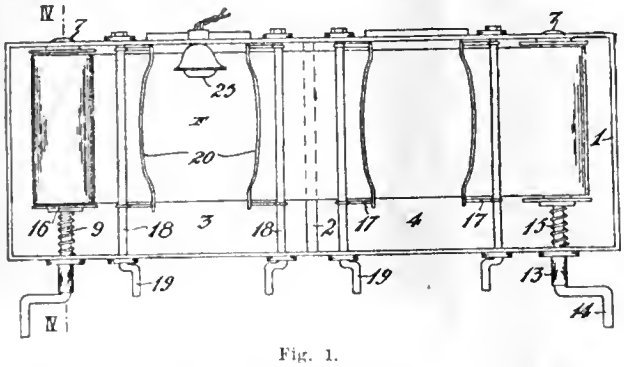


Fig. 1.

enters the axial recess 10 of the spool and is provided with a transverse pin 11 the projecting ends of which engage end recesses 12 formed in the end of the spool. The shaft 9 extends through the wall of the tank and a bearing sleeve 13 thereon and is provided with means to rotate the shaft such as a crank handle 14. A spring 15 is wrapped on the portion of the shaft between the tank wall and a washer 16 at the inner end of the shaft which maintains the connection of the spool with the shaft.

In order to release the spool the latter is moved endwise against the pressure of the spring to free first the stud 7 and then the inner end of the crank shaft and by reverse action the spool is rotatably fitted in the tank.

The end of the wrapper attached to the film spool 5 is passed along the tank and its end is attached to the transfer spool 6, means being provided for insuring the film F as it

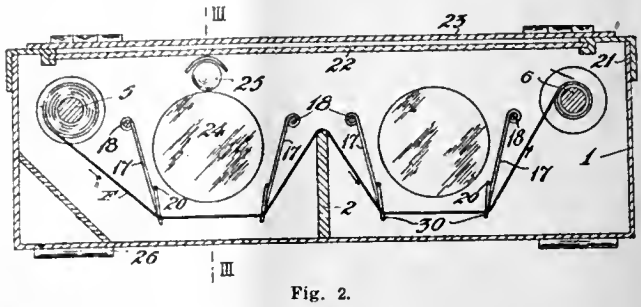


Fig. 2.

is drawn from spool 5 to spool 6 being immersed in the liquid in the receptacles.

The means for immersing consist of arms 17 arranged in pairs on shafts 18, one pair to a shaft. Each shaft is rotatably mounted in the side walls of the tank, one end of the shaft projecting through the wall and bent to form a crank handle 19

The arms bear upon the side edges of the film and the arms of each immerser may be connected by a curved bridge piece 20. The arms and bridge piece may be formed of a suitably bent single length of wire the ends of which are

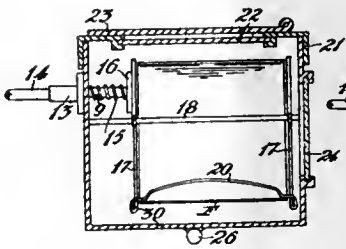


Fig. 3.

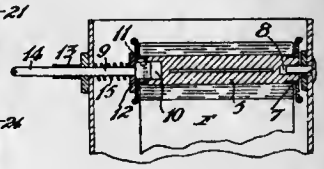


Fig. 4.

fixed to the shaft 18 whilst the downwardly projecting loops 30 act as guides for the film. It will be understood that by turning the crank arms a portion of the film, *i.e.* a single negative, may be pressed down till fully immersed in the developing solution or the water.

The cover of the tank may be a ruby tinted glass slide fitting guideways on the top edge of the tank, or a flanged metal cover 21 may fit over the tank, the cover having a ruby glass panel 22 and being provided with a hinged lid 23.

One side of the tank may be provided with a ruby tinted glass panel 24 to admit light on the negative in each receptacle so that by looking down through the transparent panel 22 of the cover the progress of development of each negative in succession may be observed.

Instead of the transparent side panels an electric ruby tinted lamp 25 may be provided on the interior side of the tank wall as shown in figs. 1 and 2. Henry Charles Frank Morant, Monbuek, Riversdale Road, Hawthorn, Victoria, Australia

SELF-PORTRAIT SHUTTER RELEASES.—No. 167,898. (June 1, 1920). The camera, which may be of any ordinary type indicated at 10, is provided with the usual flexible tube 11 having a bulb for controlling the operation of the shutter, but in lieu of such a bulb the apparatus includes a cylinder 12 which is in communication, by means of a nipple 13, with the tube. A reservoir 14 having a nipple 14^a, with which may be connected an ordinary bicycle pump for producing pressure within the reservoir, is in communication by means of a tube 16 with a pressure chamber 17, the communication being controlled by a valve 18 which is yieldingly held seated by means of a spring

19. This valve is carried by a lever 20 provided with an armature 21 arranged in relation with an electric-maguet 22, in circuit with a battery 23 controlled by a switch such as of the push button type indicated at 24, any suitable length of connection 25 being arranged between the switch and the battery and magnet, which are preferably arranged in a small compact space.

Within the cylinder 12, which is in communication with the pressure chamber 17, is a piston 27 yieldingly held in a repressed position by an actuating spring 28 which is compressed to cause a discharge of air from the upper portion of the cylinder to the shutter actuating means through the tube 11 by an

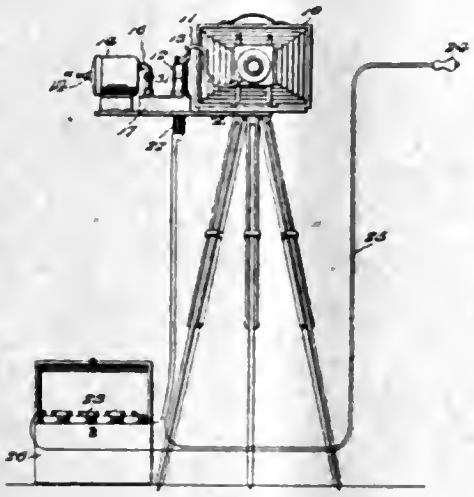


Fig. 1.

increase of pressure in the chamber 17 sufficient to move the piston in opposition to the spring 28.

The reservoir being charged with a suitable pressure of air, and the several connections having been made, the closing of the circuit through the battery and magnet by the operation of the switch 24 will cause the attraction of the armature 21 and the unseating of the valve 18, which, admitting pressure to the chamber 17, will result in the actuation of the piston and the discharge from the upper end of the cylinder 12 of a sufficient

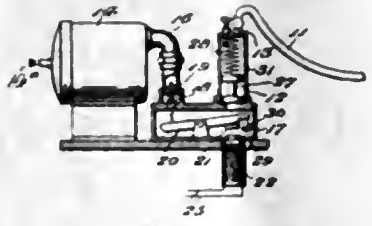


Fig. 2

quantity of air to actuate the camera shutter. If a snapshot is to be taken it is simply necessary to momentarily close the circuit and then permit it immediately to open, whereupon the pressure within the chamber 17 will escape through the outlet 29 and the spring 28 will restore the piston to its normal position and permit the camera shutter to close. On the other hand, if a time exposure of any desired duration is required, it is simply necessary to maintain a closed circuit through the magnet for the required length of time, the lever 20 being provided with a closure 30 for the outlet 29 when the armature is in its attracted position and the valve 18 is open.—Hans Benjamin Emmrich, Giddings, Lee County, Texas, U.S.

The following complete specifications are open to public inspection before acceptance:—

Apparatus.—No. 183,441. Optical apparatus for reflecting still or animated photographic images. C. van Soolen.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

Lumograph.—No. 426,511. Pictures, photographs and printed matter included in class 39. Harold Bernardo Molins, 2, Evelyn Street, Deptford, London, S.E.8, manufacturer. May 25, 1922.

MARKS PLACED ON THE REGISTER.

The following marks have been placed on the register:—

Iconta.—No. 423,292. Optical, photographic, cinematographic, and projection apparatus included in class 8. Ica Actiengesellschaft 72-80, Schandauerstrasse, Dresden, Germany, manufacturers.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Monday, August 14.

Southampton C.C. Informal Meeting.

Tuesday, August 15.

Bournemouth C.C. Outing to Poole Park and Backwaters.
Exeter C.C. Portfolio by the late A. H. Lisett, F.R.P.S.
Hackney Phot. Soc. "Lantern Slides." A. D. Fort.
Hammersmith Hampshire House P.S. Affiliation Prints.

Wednesday, August 16.

Dennistoun Amateur P.A. S.P.F. Blue Book.
Partick C.C. Winter Syllabus and S.P.F. Blue Book.

Thursday, August 17.

Hackney Phot. Soc. Outing—River Trip.
Sheffield Phot. Soc. Outing to Canal Side.

Saturday, August 19.

Dennistoun Amateur P.A. Outing to Helensburgh.
Edge Hill C.C. Outing to Knowsley and District.
Hammersmith Hampshire House P.S. Outing to The Temple.
Wallasey Amateur Phot. Soc. Outing—Overpool Valley.

EDINBURGH SOCIETY OF PROFESSIONAL PHOTOGRAPHERS.

Meeting held at 116, Hanover Street, Edinburgh, on July 28. Present: Miss Grace D'Arcy, Messrs. J. Campbell Harper, George Balmain, A. Swan Watson, J. C. Bambrick, and E. D. Young. Mr. J. Campbell Harper, President, in the chair.

The Secretary read a letter from Mr. Harold Hood, of Middlesbrough, thanking the Society for sending a copy of its rules, and saying that he hoped to made good use of them in forming a similar Society for the North-Eastern District of England.

The President reported that he had called on Mr. McNally, of the Education Department, with regard to securing a teacher in place of Mr. Hislop, for the optics and practical chemistry class. Mr. McNally stated that he had no one in view, but that he would make every endeavour to secure the appointment of a trained teacher before the beginning of the session.

The secretary read a letter dated May 25, 1922, which he had received from the Secretary of the Glasgow and West of Scotland Society of Professional Photographers. He stated that he had consulted with the President on the terms of the letter, and had replied that without discussion the boundary line proposed appeared to be satisfactory, but that it must be left to the country photographers themselves to choose which Society they wish to join. This was approved of by the meeting, and it was resolved to allow the matter to be over until the next meeting.

The Secretary reported the response which he had received to his circular letters addressed to the photographic dealers and manufacturers inviting them to take stalls at the proposed forthcoming congress and fair. As the support promised from the trade was so unsatisfactory, the Society did not feel justified in holding the Fair. It was, accordingly, resolved not to proceed with the proposed congress and fair in March next, but that the Society should consider at its next meeting whether a congress and exhibition should not be held instead. The Secretary was instructed to notify those members of the trade who had agreed to take stalls, and also those

who were at present considering the matter, and thank them for their support and co-operation.

Mr. Young drew attention to a statement in this month's "P.P.A. Record," and also on the back of the P.P.A. Membership Card, where it is stated that this Society was affiliated to the P.P.A. The Secretary was instructed to write the Secretary of the P.P.A. and point out that such is not the case, and that the statement must have been made under a misapprehension.

A vote of thanks to the Chairman concluded the business.

Commercial & Legal Intelligence.

NEW COMPANIES.

YVONNES (LEEDS), LTD.—Private company. Registered July 27, with a capital of £700 in £1 shares. Objects: To carry on the business of photographers, lithographers, artists, picture dealers, manufacturers of and dealers in photographs, engravings, etc. The first directors are: H. Warrillow, British Queen Inn, Hunslet, Leeds; Miss W. M. Warrillow, British Queen Inn, Hunslet, Leeds; Miss F. G. Warrillow, British Queen Inn, Hunslet, Leeds. Registered office: 24, Albion Place, Leeds.

LIVINGSTONE ART CO., LTD.—Private company. Registered July 25, with a capital of £5,000 in £1 shares. Objects: To carry on the business of photograph enlargers and photographers, picture framers and importers, makers, sellers and dealers in pictures and picture frames and mounts, artists' colours, oils, paints and brushes, etc. The subscribers (each with one share) are: L. G. Howes, 90, Estcourt Road, Woodside, Surrey, secretary; W. W. Watling, 160, Crofton Park Road, Brockley, S.E.4, solicitor's clerk. W. R. Livingston is permanent managing director. Registered office: Sentinel House, Southampton Row, W.C.

News and Notes.

OWING to the Hampshire House (Hammersmith) Photographic Society's rooms being destroyed by fire, it has been necessary to make other arrangements and to change the day of meeting to Tuesday of each week, *pro tem.*

IRISH SALON OF PHOTOGRAPHY.—The Executive Committee of the Irish Salon of Photography announce that, owing to the disturbed condition of the country, they have, with great regret, decided to postpone, until further notice, their first exhibition, which was to have been held in August.

A NOVEL SUBJECT.—Probably the most-photographed man in London last week was one who cut the grass in Parliament Square with a scythe. The old-fashioned tool looked strangely out of its element, and many scores of amateur photographers, as well as several Press workers, seized the opportunity of making exposures on what was truly a novel subject.

A WITCH DOCTOR'S PHOTOGRAPH.—An interesting photograph of a witch doctor was reproduced in the "Daily Telegraph" of the 2nd inst. This extraordinary photograph was obtained with difficulty by a party of English explorers on a journey from the Zambesi to Khartoum. Witch doctors, or mystery men, in common with many Central Africans, have a great dislike to the camera, but the individual pictured was induced to pose in full regalia, with his stock-in-trade arranged for consultation.

P.P.A. CONGRESS NOTE.—The Council of the Professional Photographers' Association of Great Britain and Ireland, Ltd., desire to remind all members that it is imperative they should bring their membership cards with them to the Congress, as the cards must be shown on all occasions when requested. Members who have not paid their subscription for 1922-23, and are not in possession of their membership card, are not entitled to vote at the annual general meeting, or to have free admission to the Congress, lectures or excursions. Members who desire to bring a professional friend to the Congress can obtain from the secretary, Mr. Alfred Ellis, a special card (price five shillings), giving all the privileges of membership during the Congress week.

A COURT PHOTOGRAPHER is reported by the "Evening News" to have said: "Every woman, old as well as young, should come to be photographed wearing a dress of light colour. If pince-nez or spectacles are usually worn, they should not be taken off for the photograph." "Does this apply to huge, round, tortoiseshell goggles?" he was asked. "Ah," was his reply, "I'd better make those the exception to the rule. For they are often worn as a fashion, not quite as a necessity. I'm afraid they would not add to the beauty of the photograph."

MR. PIRIE MACDONALD.—We clip the following paragraph from "Abel's Photographic Weekly": Mr. MacDonald is going to England in the fall as official delegate from the P. A. of A. to the British Congress of the Professional Photographers' Association of Great Britain and Ireland, and will present a silk U. S. flag to that Association on that occasion. Mac will then run over to Paris—wager he flies over—and will present a similar flag to the French Photographic Association, or Chambre Syndicale Francaise de la Photographie, as it is officially termed.

AMERICAN ADVERTISING.—"Abel's Photographic Weekly" states that among the photographers' trade cards seen at the Seattle Convention was one used by H. G. Nelson, of Elma, Wash., which had printed upon the back this very apt quotation from Elbert Hubbard:—"Faces fade, and the people we once knew, some of them, are gone for ever. Children grow up and go away. The old house is torn down. The pets die or disappear. The time to take the picture is when you see it. The historic value of things, fixed in the form of a photograph, is beyond price."

THE PARAGON CAMERA IN TIBET.—Messrs. W. Butcher and Sons, Ltd., received by last week's mail from Tibet a very interesting photograph and letter from Capt. J. Noel, the official photographer to the 1922 Mount Everest Expedition. The letter, which was written on May 5 at the Main Base Camp, Rongbuk Glacier, Tibet, reads as follows:—"Dear Sirs,—I have pleasure in telling you your Paragon camera is serving good use with the Mount Everest Expedition It is an excellent camera for the simplicity yet completeness of its controls and movements. I find the lens turret and back control panel very special features. I enclose you a photograph of the camera and myself at the Base Camp of the Expedition below Mount Everest at 17,000 feet, on the Rongbuk Glacier, and I hope you will like the photograph.—Yours faithfully, J. NOEL."

THE IMPERIAL HANDBOOK FOR 1922 has reached us, and a very beautiful production it is. It is as full of useful information as the proverbial egg is of meat, while the illustrations are far above the average. It is close on thirty years since the first Imperial Handbook was published, and every year, without a break, the booklet has made its appearance, each issue being eagerly seized upon and perused by all classes of photographers. The 1922 production contains many well written articles dealing with the firm's roll-films, "D.S." backing, and other specialties, also special illustrated articles on "Record Work," "Studio Lighting Out of Doors," "Process Plates for Ordinary Work," "Byways in an Old Town," "Panchromatic Plates," and "Photography in Lamplight." Copies may be had gratis from dealers, or direct from the Imperial Dry Plate Co., Ltd., Cricklewood, London, N.W.2.

BEACH PHOTOGRAPHERS' BAD SEASON.—A photographer who has a stand on the sands at one of the most popular South Coast health resorts, writes as follows: "The paragraph in the "B.J." telling of our bad luck this season, mainly because of the inclement weather, is only too true, but we live in hopes for a good August and a better September, so that we may make good our losses, but it has been a difficult matter for us and our few sitters to 'look pleasant' when high winds and drizzle were about. July was one of the wettest summer months on record. The rainfall during the month was nearly an inch and a half above the normal. As a contrast to the sunny July of last year, there were only 140 hours of sunshine, compared with 257 in 1921 and the normal 201. The total rainfall during the month was nearly four inches. It was a dull month all round. Depressions converged on us from all directions. An average of 4.5 sunny hours a day in July is quite exceptional, and it was the wettest July for years."

THE CAMERA AND THE CUSTOMS.—Many photographers have been led to believe that a man who takes a foreign-made camera to the Continent may be faced with a demand for Customs duties on his return to England. This is an error (says the "Daily News").

The Board of Customs in their reply dated July 24 to a query from us to say that "it is their practice to waive payment of duty in the case of a camera imported by the owner on his person or in his luggage, if properly declared and produced to an officer of this Department examining baggage, provided the officer is satisfied that the article has been in the passenger's private use for a substantial period. An oral declaration of ownership is usually accepted, but if the camera shows no material sign of use a declaration is required on Form 104." Form 104 is the ordinary Customs form for an Owner's Declaration in respect of personal baggage, and when used to cover the return to England of a camera which the owner took out with him, it merely requires him to declare that he actually took it out of the United Kingdom on the date of his departure.

PHOTOGRAPHIC ANALYSIS OF MOVEMENT.—Particular attention is now being paid to "slow-motion" photography, and many interesting examples are being exhibited. A writer in the "Star" states that Mr. W. Pycraft, F.Z.S., has been able to prove a theory that he has long held, but which he could not prove. This is that the air is an "ocean," or "sea" for birds, used by them in the same way as the sea is used by fish. Slow-motion pictures taken of a bird in flight, a fish swimming, and a turtle's flippers in motion, show that all the movements are similar. Ordinary film negative contains 16 pictures to the foot, and the ordinary cinematograph camera, it is pointed out, "takes" at the rate of a foot a second. The ultra-rapid camera for slow-motion pictures takes at 250 pictures a second (or about 15½ feet). The result is that a motion which would be shown in 16 pictures of ordinary film, needs 250 pictures of the ultra-rapid camera to show it. Each particular motion thus slowed down can be minutely analysed and studied. The writer also mentions Mr. Bruce Woolfe, who has taken slow-motion photographs at the Zoo of a kangaroo jumping and of a seal diving. Another picture is of a toad eating. Toads eat by darting out a tongue and drawing in insects, etc., on it. Each dart takes about a sixteenth of a second, so that by the ordinary film camera one picture goes to each dart, and all one can see is a slight blur on the negative. With the special camera every movement of this tongue can be distinctly followed. So also is it with a snake's fangs. To watch the forked tongue with the ordinary eye one would think that this darting is an indiscriminate waggle. The camera shows that this forked tongue always moves the same way. Scientists before had suspected many of these things. They could never prove them.

Correspondence.

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

*** *No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE "FREE-SITTING" AGAIN.

To the Editors.

Gentlemen,—As a regular subscriber to the "B.J." for many years I have read of the attacks that have been made upon the free-sitting photographers, including, of course, your recent note ("B.J.," June 23), and one later referring to it ("B.J.," July 28), and as far as I can understand none of the free-sitting photographers has had the courage to pen a line in defence of his methods; all appear to have taken the attacks "lying down," and to have gone on as usual in their own sweet way.

I am interested more in the scientific than in the professional side of photography, and as a looker-on I claim to be able to see most of the game as it is played by professionals, and I must confess that I have a great deal of admiration and sympathy for the free portrait man, who has plenty of initiative, an unbounded faith in human nature, and does not mind speculating: "Faint heart never won fair lady" being his motto.

Even the greatest opponents to the free-sitting I believe admit that it is in certain cases a perfectly legitimate plan of working. What professional worker would object to give Miss Ethel M. Dell a free-sitting? Not one. Her portrait was, and still is, in great demand, but it does not exist, and he will be a lucky worker who first secures one. There are, of course, many other celebrities who have never been photographed, but I mention Miss Dell because of the lady being at the moment in the public eye. If this point be granted—as I feel sure it will be—then where are we to draw the dividing line between what you state to be the legitimate and the illegitimate? Here is the difficulty, and the free-sitting game has got into disrepute because some photographers are said to have overstepped the mark.

There must be differences of opinion as to who is and who is not a celebrity, and a man may go to bed at night a nonentity, only to awake in the morning to find himself famous—or, at any rate, a suitable subject for the illustrated papers. I need not, however, labour this point, as there is a stronger one in favour of the free-sitting man.

The strong point in his favour is speculation, and there is so much and so many against him that it is difficult to believe that he can win, but I suppose he does at times, otherwise the free-sitting would become a thing of the past. Much money must be spent in circularising likely people, and the making of the pictures must give work to several hands—who, I suppose, have to be paid—and all this is done on the chance of getting an order. I often wonder what the percentage of orders really is, and judging from the comments I have heard from those who have accepted free portraits I should say it is exceptionally small. But does the free-sitting man worry his clientèle if no orders come along? I do not think so. He writes off the sales to the sitters, and waits for the demands of the Press for which the portraits were taken. If there is no demand then the photographer has speculated unwisely and loses, but we hear of no grumbling because he has only himself to blame. What grumbles are heard come from those professionals who failed to speculate, doing business only when called upon to do so. If then there be no demand from the Press, or from the sitter himself, for copies, no harm is done to brother photographers who carry on business in the orthodox manner.

People who really want their photographs taken usually go to a studio and pay for them, and they do so, as a rule, before the free-sitting man reaches them.—Yours faithfully,

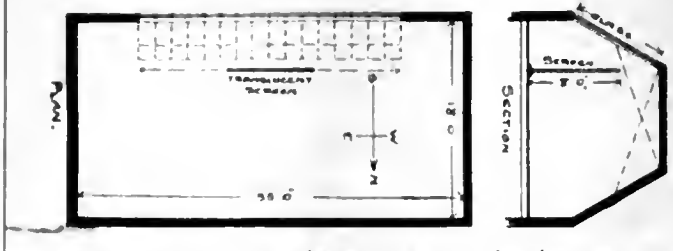
London, N. H. M. ROBINSON.

A SOUTH LIGHT.

To the Editors.

Gentlemen,—Apropos your Editorial note on the above, in the issue of the "B.J." dated July 28, may I add that the solution of this problem by the late Valentine Blanchard, which is, I think, still the best way out of the difficulty, is fully described, with plan and section, in my monograph on "The Studio," which forms No. 182 of "The Photo Miniature" (New York: Tennant and Ward).

I am also sending you herewith a diagram of a modification of the idea, of my own design, in which the black solid lines represent the opaque portions of the walls and roof of a single slant studio, the shaded portions of the glass being of rough cast plate and the shaded movable screen of tracing cloth or other translucent



material. As in Mr. Blanchard's studio, "The sitter cannot see the side of the screen on which the sun's rays fall, so that there is no sunlight to dazzle the eyes, and as the sun travels westward the screen can be drawn to the east, to give more light if necessary; while working with the sitter at either end of the studio the screen can be moved about according to the time of day, and yet give the sitter all the light required."

Anyone who will try an arrangement like this in a south lit studio will find that, in addition to being able to cut down exposures, he will be able to obtain many luminous yet delicate effects that are difficult, if not impossible, under other conditions.—Yours faithfully,

DRINKWATER BUTT, F.R.P.S.

2, Margravine Studios, Baron's Court, W.6.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

L.A.—We have not heard of the Photo Autocopyist Company for a long time and do not know whether the business is still being carried on. They were formerly, as you say, at 64, Queen Victoria Street, E.C. Messrs. A. W. Penrose and Co., 109, Farringdon Road, London, E.C.1, have, or had, a somewhat similar process. It might be worth while to write to them.

H. C.—If you do not use direct light we think that a saturated solution of potassium bichromate is reasonably safe for use with ordinary plates; that is to say, if the lamp is arranged on a wide shelf above the working bench, so that all dishes, plates, etc., are in the shadow of the shelf. But in order to make the light safe for the exposure of plates to direct rays, it is necessary to add dye to it, e.g., rose bengal or fast red. It is not very satisfactory to use this mixture, because the dye is gradually oxidised by the bichromate, and, in fact, we are rather at a loss to understand what particular advantage you expect to gain by using this rather cumbrous method of immersing a bulb in a coloured solution. We think one or other of the ordinary types of lamp working by reflected light is very much better.

F. S.—Three focus means that the front and rear glasses of the complete lens are of different focal lengths, so that altogether you get three focal lengths. Usually one of these is double the focal length of the complete lens and the other one about one and a-half times the focus of the whole lens. We should imagine that the lens is some kind of anastigmat, but the description is not enough for us to say. Apparently the diaphragms are marked according to the U.S. or Uniform System, much used in America, but it is rather strange that the full aperture is U.S.8, which is equivalent to f/11.3. It almost looks as though the lens had been tampered with in some way, and the fact that it does not give sharp focus when focussed sharply on the ground glass seems in accordance with this.

C. H. K.—(1) The following is a formula recommended by the makers of metol :—

Water (distilled)	20 ozs.
Metol	130 grs.

Dissolve the metol and then dissolve in the order given.

Soda sulphite cryst.	3 ozs.
Potass. carbonate	1½ ,,
Potass. bromide	18 grs.

This stock solution keeps well; for normal exposures, it is mixed with three to four times its bulk of water; for over-exposures, with about twice its bulk of water; and for under-exposures, with about six times. For over-exposures where increase of contrast is required, add 10 per cent. potass. bromide solution. (2) We think you can obtain match-boxes with any required design on them from the Glossoid Co., 8, Mason's Avenue, London, E.C.2.

C. M.—Optical goods (including cameras) brought into this country from Germany pay a duty of 33⅓ per cent., in addition to the reparations duty of 26 per cent., which has to be paid to the German authorities before goods may be taken out of Germany. We understand that a very strict examination is made of passengers' luggage, both at the German frontier and when re-entering England, in respect to optical and photographic goods. We do not think for a moment that the fact that the camera has been used personally between the time of its purchase and its entry into England will be any ground for exemption of payment of the duty either in Germany or here. Under the Safeguarding of Industries Act the duty is, in fact, levied for the purpose of restricting importations, both retail and wholesale. We daresay that you have seen quoted, during the last few months in the "B.J.," instances where very heavy fines have been inflicted on people who have attempted to smuggle single cameras into the country.

P. H.—We do not know a formula for the true-scale composition which we can recommend, for a somewhat extensive correspondence with engineering photographers, who are using this process, has shown that no composition made up according to formulæ which have been published works nearly as satisfactorily as the compositions bought from a firm such as B. J. Hall & Co., Ltd., Chalfont House, Great Peter Street, Westminster, London, S.W.1. (1) The blue print is kept in contact with the composition for about 15 seconds. (2) We do not think it is practicable to treat the composition so as to prevent parts from printing dirtily. This should be done on the blue print before it is applied, namely, by stopping out such parts by painting them over with thin, quick-drying spirit varnish. No doubt something can be done on the composition itself by carefully sponging with a damp sponge or rag. You will find the best instructions for the working of the process in the manual by B. J. Hall, "Blue Printing and Modern Plan Copying," published by Sir Isaac Pitman & Sons, Parker Street, Kingsway, London, W.C.2, price 6s. net.

P. P. J.—In our issue for May 28, 1915 (page 359), W. Ethelbert Henry published the formula for the white-image developer manufactured and sold for some years past by his firm, the Vanguard Manufacturing Company. On an ordinary gelatino-bromide plate, or dry ferrotype plate, it develops similarly to collodion—both as to image and rapidity of action, the main trouble (to the uninitiated) being to judge when development is complete. The developer is used at full strength, and can be returned to the bottle for repeated use without discolouration. The formula, reduced for users on a small scale, is as follows:—

A.—Dry sodium sulphite	3½ ozs. av.
Hot water to make	16 ozs. fl.
While hot, add—	
Quinol (hydroquinone)	120 grains.
B.—Ammonium chloride	3½ ozs. av.
Ammonium bromide	40 grains.
Hot water to make	16 ozs. fl.
C.—Strongest liquid ammonia	2 ozs. fl.

Add B to A, and then add C. Filter when cold.

The following are the instructions for the use of the developer, which, we believe, is still supplied by the Vanguard Manufacturing Co.:—"The plate must receive a full exposure, and must then be developed with this solution without the addition of any water whatever, the plate must then be fixed in an ordinary clean hypo bath. The developer should be returned to the bottle after use, and it will be found to remain in prefectly good condition for a very long time without the slightest discolouration. When first used, the operator will have some difficulty in noting the appearance and development of the image, owing to the fact that the developer causes a white deposition of metallic silver. It can, however, be followed to some extent by viewing the plate occasionally by looking through it towards the light. After one or two trials, there will be little difficulty of this kind."

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. PRICE FOURPENCE.

TERMS OF SUBSCRIPTION POST FREE.

UNITED KINGDOM OR CANADA.—*One Year*, £1 1s. 8d.; *Six Months*, 10s. 10d.; *Three Months*, 5s. 5d.

ANY OTHER PART OF THE WORLD.

One Year	£1 3s. 10d.
Six Months ...	12s. 0d.
Three Months	6s. 0d.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibits the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3250. Vol. LXIX. FRIDAY, AUGUST 18, 1922. Price Fourpence.

Contents.

SUMMARY.

In a further paper of the series, "With a Portraitist in the Studio," Mr. J. Effel deals in an instructive and entertaining manner with the problem of the bust portrait and also with the three-quarter length picture. (P. 488.)

When every care has been taken in the making and mounting of photographs, deterioration may often take place within a comparatively short time through the bad conditions under which the photograph is kept. In a leading article we refer to some of the chief causes which may give rise to such deterioration after photographs have passed into customers' hands. (P. 486.)

In the second chapter on depth of focus the different senses in which the term "hyperfocal distance" has been used are considered. It is shown how the formula for hyperfocal distance is obtained on the basis of a fixed permissible disc of confusion in the negative and how this formula assumes a simpler shape if the permissible disc of confusion is taken as a certain small fraction of the distance from which a print or enlargement is viewed. These formulæ likewise tell the F. number or actual diameter of stop which is required, according to one view or the other, for a given hyperfocal distance. (P. 492.)

Working details of a novel method of cutting rectangular masks with but one cut of a knife are given on page 487.

Although photographic printing processes are often roughly classed as "permanent," and otherwise, a very great deal depends upon the degree of care which is taken in the making of the print. (P. 486.)

Considerable opportunity for the exercise of judgment in determining exposure is required, even when using a meter, particularly as regards making allowance for the scale of tones, some useful hints regarding which will be found on page 491.

There still seems to be the need for cautioning those sending negatives through the post against the flimsy packings which are still often used. In a paragraph on page 486 we briefly describe the form of packing which can be relied upon to ensure the safe transit of negatives.

Vest-pocket negatives which are to be enlarged upon a considerable scale call for more than ordinary preparation in the shape of retouching of defects on the film side and elimination of scratches on the glass side. (P. 485.)

For several reasons no useful purpose is served, in our opinion, by prescribing any particular quantity of hypo as sufficient for the fixation of such and such a number of prints. (P. 485.)

The desirability of a British Empire Patent was one of the problems discussed at a recent Government conference. A scheme was put forward for the establishment of a central office. (P. 499.)

EX CATHEDRA.

Scratched V.P Negatives. Despite the great efficiency of cameras of the vest-pocket size as regards obtaining sharply focussed pictures, the user of them, who comes to making enlargements from the little negatives, encounters difficulties due, not only to minute imperfections from dust, etc., on the emulsion film, but also to scratches on the glass side. For the former, perhaps the best plan is to coat the whole surface with retouching varnish and to go over the negative, with the aid of a magnifier, with a retouching pencil. As regards the glass side, owing to the thinness of the glass generally used for vest-pocket plates, scratches will very frequently show in the enlargement. They can, however, be eliminated by cementing a clean glass plate to the negative with Canada balsam. Negative and glass should be well warmed, a drop of balsam put on the back of the negative, the cover glass carefully brought into position, and pressed down so as to drive out air-bells. The two glasses then require to be held under firm pressure, as can conveniently be done by means of an ordinary lantern-slide binding clamp, for the balsam to set and harden. While under this pressure the glasses should be brought to a moderately high temperature in front of a fire or in an oven.

* * *

Hypo for x Prints. Every now and again we are asked by correspondents to tell them the quantity of hypo which should be allowed for the fixation of so many prints. While economy in the use of chemicals is not to be deprecated, stinting of the fixing bath is, we think, the worst form which such economy can take. Moreover, we do not think it is possible to name a quantity of hypo sufficing for the proper fixation of a given number of prints, since the conditions under which the fixing bath is used vary so greatly. It is true that in the past several people have prescribed the quantity of hypo for a given area of paper. MM. Lumière did so some years ago, and an American professional has recorded his experience of using hypo in the proportion of one ounce per 330 square inches of paper. But such figures are not applicable with safety to regular commercial conditions, for in arriving at them more than customary care is taken to ensure each separate print being fully exposed to the action of the fixing bath, whereas, in commercial practice, such is often far from being the case. Further, papers vary in the proportion of silver salt which they contain and also the temperature factor considerably affects the useful work which a given bulk of hypo solution will do. And if these causes of variation were not enough, there is a further one which is often overlooked altogether. This is the continuous dilution of the hypo solution which goes on by the introduction of prints undrained from the developing solution or wash bath and the corresponding abstrac-

tion of hypo by removal of prints with a goodly proportion of fixing bath adhering to them. From both these causes the strength of the fixer may be very substantially reduced without the user realising the fact. On all these accounts there is only one good rule for practice, namely, to use plenty of hypo and preferably to pass prints through two fixing baths in succession. In the making of prints which command a fair price the cost of a triple or quadruple quantity of hypo above that which is theoretically necessary is insignificant.

* * *

Packing Negatives. It might perhaps be thought that photographers for generations have been sending glass negatives through the post with such frequency that secure packing had become a question of instinct. Yet it is our experience and, we believe, also that of the enlarging firms, that negatives are very frequently dispatched with the most inadequate protection against the operators of the defacing stamps in the postal sorting offices. Anybody who has occasion to send a negative by post ought to try to realise the hammer blows to which parcels are subjected on the tables of a postal depôt. Against these destructive efforts, there is only one kind of effective measure, and that is to shelter the negative in a rigid casing, the outside walls of which will take the shock of the defacing stamp. A cardboard box, such as that in which plates are supplied, if wrapped in a few layers of corrugated paper, will no doubt afford sufficient protection in nine cases out of ten, but in the tenth instance the negative, even when carefully packed in this manner, may be broken in transit. On the other hand, it may be taken as reasonably certain that a negative packed in a wooden box with a resilient flat packing, such as corrugated paper, above and below it, is in a condition to defy the postal officers to do their worst. Corrugated paper is better for this purpose than crumpled newspaper, since it affords a flat elastic bed for the negative, and does not provide the occasion for local strain on a sudden shock to the whole box. Cotton-wool or fine wood shavings are probably as efficient. If several negatives of different sizes are being sent together in one box, care should be taken to place all those of a size together, so as to prevent the smaller from bearing unevenly on the larger. The two lots should, moreover, be separated by one or other of the kinds of packing we have just mentioned.

* * *

Permanency When we are asked to say whether the prints on such and such a paper or by a given process of toning are permanent, we are inclined to take a leaf out of the book of a butler in one of the plays of Mr. Henry Arthur Jones. The butler was pressed by a suspicious husband to swear the truth of what he had said about her ladyship's movements. He discreetly replied that he had spoken "the absolute truth in the circumstances." The application of which is that permanence is a quality of photographs which can only be described relatively, that is to say, in relation to the care taken in the working of the process, in relation to the conditions under which the print is kept and to other factors. Assuming that the respective processes are worked in the best manner, one may group them for permanency according to a schedule which includes a range from carbon and platinum, through development prints with and without toning, to the print-out and self-toning papers. Probably nothing short of wilful destruction is capable of destroying the image on a carbon or platinum print. There was the instance some years ago of a platinotype print having been recovered intact and practically as good as when made from a sunken vessel where it had lain immersed in sea water for several months. The permanency of development and P.O.P. prints, on the other hand, is more largely dependent upon the care taken in making them. Although theoretically a developed silver image is less subject to chemical alteration than one which is printed-out and toned, we would not be prepared to say that the bromide prints of one photographer are more permanent than the P.O.P.'s of another. In fact, we could point to many cases where bromide prints have shown disfiguring markings after a few months, and to others where P.O.P.'s have retained their freshness for years.

THE CARE OF PHOTOGRAPHS.

Considering the very large proportion of portrait photographs which are now made on emulsion development papers, it is a matter of some regret that photographers should not employ more persuasion than we think many of them do at the present time towards ensuring the preservation under the most favourable conditions of the prints which they supply to their customers. The fact cannot be disregarded that the silver image of a development print is bound to suffer a certain amount of change within a few years unless means are taken to delay the processes which give rise to that change. Inasmuch as prints suffer by constant exposure to the air of rooms where gas or stoves are burning, producing slowly a partial sulphurisation of the silver image, the first step in the preservation of photographs is to protect them, as far as possible, from the action of the air. The second measure consists in keeping them in as dry a condition as possible, since any action of the minute quantities of sulphur compounds in the air is accelerated by a moist condition of the prints. A conjunction of both unfavourable conditions may give rise to marked deterioration of prints within a comparatively short time, the original brightness of the photograph being defaced by a species of bloom of semi-metallic appearance. In some cases, which apparently are not as infrequent as might be thought, photographs exposed in an unprotected state on damp walls have actually suffered disaster by being eaten into white patches by insects. The protection against these causes of deterioration is proper framing of the print before it leaves the photographer's hands.

Quite apart from the considerations of tasteful presentation of his work, or of the profit from the supply of frames, there is every reason for the photographer to prevent his work being framed in accordance with the method which is largely followed by the cheaper class of picture framers. The latter cannot be expected to take the care which a photograph from its nature requires. It is rare to find that any steps are taken to exclude air, and very frequently the backing board and the brown paper covering for the back of the frame are put in practically saturated with moisture, so that conditions are made as favourable as possible at the very start for any deterioration to which the photograph may be liable. It is scarcely necessary to point out that the glass should be secured to the rebate of the frame by means of strips of paper, so as to prevent the access of dust and air. In like manner the jointed backboard should be sealed into the frame by gummed strips, so that the picture is in practically an air-tight case, and these paper junctions should be given every opportunity to become dry before the final paper backing is applied. It is an excellent plan, whenever possible, to bind the picture and glass together in passe-partout fashion before insertion in the frame. For the backing, a sheet of stout

manilla paper may be fastened with good glue, and may be caused to stretch taut by a very moderate degree of damping. A further precaution against the access of this moisture to the contents of the frame is to lay a sheet of waterproof paper upon the backboard before applying the final brown paper covering.

The principles which apply to ordinary framing require to be observed equally for miniatures which are put into lockets or rims. Here again air and moisture need to be excluded, by sealing the miniature within its rim with strips of goldbeater's skin, as was invariably the practice in the old days. If goldbeater's skin is not readily obtainable, although most chemists keep it, the thin paper sold in rolls for mending books and music will answer nearly as well for all but the smaller sizes. While we are upon this subject of the delivery of work in the best conditions for permanence, we may add a word on the treatment of originals sent to a studio for copying. These, to say the least, should invariably be replaced with every care for their future preservation, when it has been necessary to remove from a frame or detach from a cover glass, yet it has been our experience to find old and valued portraits put back into their frames or cases with the edges unbound and thus exposed to more deterioration in a few months than they had previously undergone in years.

MASK CUTTING SIMPLIFIED.

[The following is the text of a paper read at a recent meeting of the Croydon Camera Club, where it was accompanied by a demonstration. The Society's reporter described the method as an "ingenious stunt," as indeed it is, and illustrated working details will, no doubt, be welcomed by all cutters of rectangular masks.]

In the masking of prints and lantern slides, rectangular masks of a specific size of opening are frequently required; but the accurate marking off and cutting of such masks (with clean, sharp corners) is a task which is often found to be both difficult and irksome.

By the application of the simple paper-folding method described below, it becomes, however, a comparatively simple operation to mark off and cut a rectangular mask of any

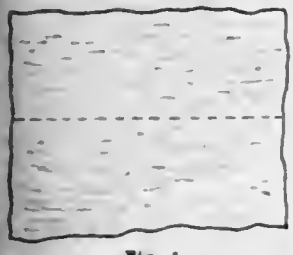


Fig. 1.

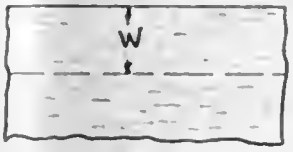


Fig. 2.

given size of opening in less than a minute, and by a single stroke of the knife.

The method can best be described in stages, illustrated by diagrams, as follows:—

1. Take a piece of paper of suitable size and fold it along the dotted line, fig. 1.

2. Rule a fine line parallel with the folded edge at a distance W, equal to half the width of opening required, fig. 2.

3. Turn over the paper and rule two lines at right angles to the folded edge and distance D apart, this distance being the difference between the length and width of the opening required, fig. 3.

4. Fold over the paper as shown in fig. 4, so that the two

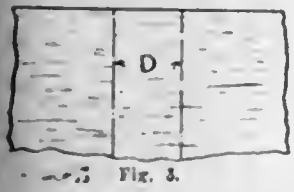


Fig. 3.

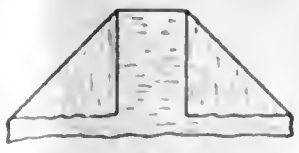


Fig. 4.

portions of the previously folded edge coincide exactly with the lines drawn as in fig. 3.

5. Reverse the now twice folded paper showing again the line ruled as in fig 2, and then cut along this line with a sharp knife against a straight edge X, as shown in fig. 5. A guillotine will, of course, be preferable if at hand.

6. Now unfold the paper and the result will be a mask as in fig. 6, in which the dotted lines show where the folds in the paper occurred.

In the case of either negatives or slides the mask can be readily attached to the film side by a touch of secotine

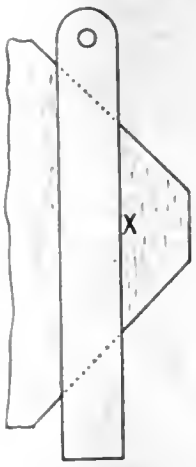


Fig. 5.

diluted with water, and the surplus paper trimmed off afterwards.

If, however, an equal margin of mask is required all around

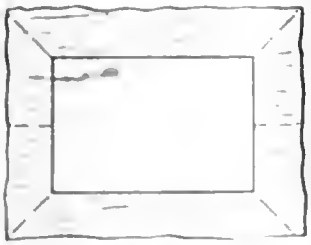


Fig. 6.

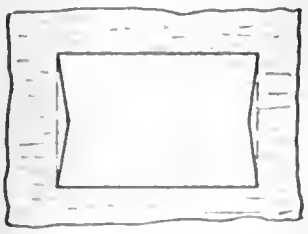


Fig. 7.

the opening it is only necessary to make a second cut with the knife after operation No. 5, leaving the width equal to the actual margin required.

The only risk of inaccuracy in that method of mask cutting lies in the folding over at right angles in operation No. 4; unless this is done carefully the ends of the rectangle will not be quite straight. If, however, care is taken never to

fold the paper too far over, an error will result as shown in fig. 7 (exaggerated for purposes of illustration), which can be quickly rectified by cutting along the dotted lines. This error is only likely to occur in large masks, and even if the adjustment is sometimes necessary the resulting time-saving is still considerable.

To facilitate the marking of the right-angle lines a set square will be found convenient, or failing this, the simple device of a piece of thick paper with one straight edge and folded accurately along this edge, thus forming a true right

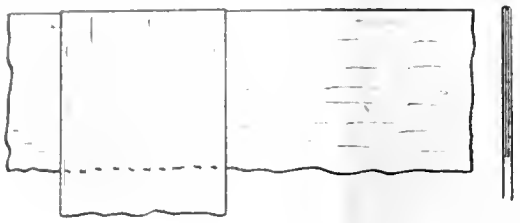


Fig. 8.

angle. In this case the mask to be marked off may be placed between the fold as shown in fig. 8.

The operation of marking off the width line in fig. 2 can be facilitated by the use of a simple rule gauge shown in fig. 9, in which the distances from the rule edge to the steps are marked at twice their actual distances, thus giving a direct measure for the width of mask. Accuracy in the making of such a gauge, using a piece of stout paper, can be ensured by folding it double and cutting both sets of steps at once. This folded gauge can then be used in place of the folded paper shown in fig. 8. The gauge shown in fig. 9 is of suitable proportions for lantern slide masks, the steps being actually 1-16 inch each.

In conclusion, it may be mentioned that this method of

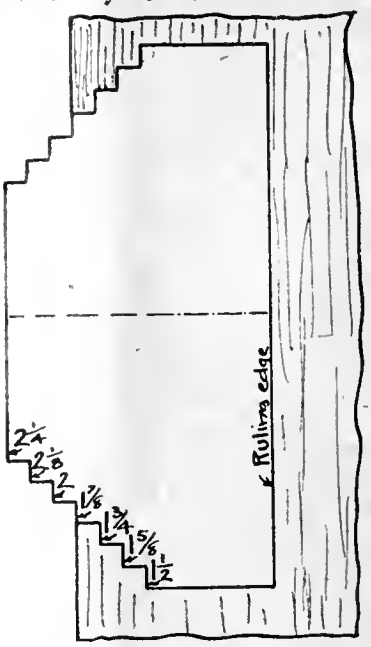


Fig. 9.

cutting masks works quite well with paper of any thickness up to that of fairly stiff drawing paper.

VIVIAN JOBLING.

WITH A PORTRAITIST IN THE STUDIO.

IV.—THE BUST PORTRAIT AGAIN.

[The previous papers of the present series by Mr. J. Effel have dealt (I) with the bust portrait and (2) with the point of view respectively in the "British Journal" of August 4 and August 11 last. In the present paper, Mr. Effel returns to the subject of the bust, and also deals with the three-quarter length portrait.]

I'm glad, George, that you have read that little paper of mine on "the point of view," and that you would like me to go over it in the studio. I think the usual way of leaving an assistant to fill in plates, change backgrounds, and stand about when pictures are being made, without telling him the reason for everything does him little good. One may see a good man doing certain things regularly for years without being any wiser. What you want to know is *why* they are done. Then when you have found out the secrets, you want adequate opportunity to test your newly acquired knowledge. Practising on sitters—the only chance for most assistants—is most reprehensible. When you are helping me in the studio with the sitters I'll try to make it clear to you, as I go along, what I am aiming at. But what you do not understand you must always ask me about when the studio is free.

I see you have a rough print of that head we took of Mr. Black. We will consider it presently. Before doing so, however, I am going to play the schoolmaster, and go back to our former lesson. What did you learn? To select the better side, to consider what should be disclosed, and what should be hidden, to determine the lighting of the face, to understand the direction of the eyes. Yes, that's about all, and then my little paper has amplified those points.

On the whole I am pleased with this picture of Mr. Black. He looks pleased with himself. The very last thing to notice before exposing is the first thing a portrait is judged by—the expression. Look at the twinkle in the eye, the characteristic puckering of the mouth, when I was chaffing him. And yet a few seconds previously he was bored stiff. There is a Chinese proverb which says that a shopkeeper who would succeed must have a smiling face. Certainly, the operator-photographer should suggest cheerfulness. I can give no rule, no formula, that will enable you to make a stranger feel quite at home when there is a camera about, and yet if you cannot do that all the rest is in vain. "Expression" does not necessarily mean a grin. Nothing but a good knowledge of human nature, wide interests, and catholic sympathies, with an inexhaustible stock of good temper, will carry you to the highest class of portrait work. I believe in creating a good impression (or rather maintaining the good impression that was begun in the reception room), keeping up the impression all the time I am occupied with the client and finishing off on the same note. I have read a good deal of "uplift" American talk, advising the photographer to cultivate conversation suitable to the individual who is being taken. This is so much nonsense. Mr. Lloyd George needs no advice on political matters from me; I would not venture on a point of theology with a bishop, nor, while studying the contours of Mr. Chesterton, would I indulge in literary criticism. All the same, if that genial writer favoured me with a sitting, I might draw him about prohibition. I bring that in with an object. There are few persons who are not susceptible to flattery of some kind. A man who is before the public in any way likes you to know the fact; probably the less importance he is to society the more he dislikes being ignored. It comes to this, George, that the supreme study for the photographer is psychology. I had a

very morose church dignitary to photograph recently. I had seen in the local press that he had just returned from the South of France, where he had been in quest of health. I congratulated him on his improvement, and, knowing something of the Sunny South, I soon had him talking away cheerfully about his holiday. I got a few splendid negatives of him when he was completely off his guard, and the order has been most satisfactory. Talk of the right sort—it varies with every client—is a valuable asset.

Don't think, George, that I'm giving you too much philosophy, the so-called "practical" side of photography is comparatively easy. You may pose, light, expose and all the rest of it, and yet only give us the clothes, and the *outside* of the subject. The one essential point of a portrait that will give satisfaction is that it must be characteristic of the client. Just look up the "B.J." of March 17 last, and regard the portrait of Mr. Wastell, the President of the Royal Photographic Society. This picture is an admirable illustration for what I have been saying. Note the good outline, the tilt of the head, the fine drawing achieved by the lighting, and, above all, the "character" of the man. One need not be told that this subject possesses a sense of humour.

This portrait of Mr. Black is equally successful. Now I want to draw your attention to this point: two three-quarter face portraits may be taken of the exact same view of the face, both may be quite good, and yet in one case the eyes look to the front, in the other away from the camera. This is determined by the relative position of the shoulders. With Mr. Black we wanted to give him breadth, so you find he is looking away slightly in the way his head is turning. On the whole, there is not much interest in a man's shoulders, and, if a one-plate sitting, I would say get the eyes to the front. Few faces have just one tolerable point of view, and if two positions are being taken it is as well to make a considerable difference, even if more apparent than real, by altering the scheme. It is still the custom with careful workers to duplicate an important negative. A clever French photographer got me out of that habit, and I pass you on his advice. Never take two negatives *exactly* the same. Assuming the same position of face, have the body, and consequently the eyes, different. A slight modification in the size of head will also make a difference. The chances are that you reject one, but there is always another position to submit—probably after the first order has been put through. Of course, conceivably, one may have a subject that would allow of no alteration, save in exposure, but that's an extreme case. Get it into your head that it is sheer folly to expose four plates, which can only yield two poses, when, with very slight modifications, three or four may be proofed.

Now, do you see any faults in Mr. Black's picture? Do you notice anything that could be altered with advantage? There are a few minor points which we will take up later, but there is a serious fault in the lighting—a fault which I committed knowingly. You can't see it, George? Well, I'll give you a valuable five minutes, that will make you see things differently, and better.

You will have gathered that I think ears are usually unlovely, and that I prefer to hide one of them. That doesn't quite satisfy me though. The remaining one is always bold, and if not restrained, insists on forcing itself to the front, as it were. Now, hold out Mr. Black's portrait, think what I have been saying, and notice the face full of delicate detail, and the ear far too well illuminated. If you will just run down and ask Mr. Black if he can spare a few minutes, we will reconstruct the picture.

I'll leave you to it, George, to reproduce the pose and the lighting. I don't wish you ever to copy slavishly the work of another photographer, but it is splendid practice to take a picture, and build one up in the studio exactly like it, without wasting a plate. Only when you know exactly how to manipulate the blinds and camera for every different effect can you be said to have a grip of the technical side of good portraiture. Yes, I think that's about how we had him before.

Now, don't you see the ear? Well, we'll soon settle that. Fetch me down that little dark screen, the "black reflector," as I heard it called. Watch the effect as I waggle it backward and forward until I get a good shadow on the ear. Skilfully used, this screen is an enormous help. Not only does it tone down undue prominences, but it helps materially to "set back" the cheeks, improving the modelling, and rounding off sharp lines of dress or coat. Keep the screen as close to the side of the sitter as ever you can. Now, if you just expose a plate on this—never mind the expression—you will be able to file the two prints, making a good record of the lesson.

I left you to focus and space both of these heads yourself. I have to show you several little things about these seemingly simple operations, which make a great difference to the complete effect of the composition. But these points had better be taken in conjunction with the practice of vignetting (in front of the lens) and other camera manipulations.

V.—THE THREE-QUARTER LENGTH PORTRAIT.

Except for children, three-quarter length pictures should generally be the most numerous in the output of a studio. In the case of men, there is precious little of pictorial interest from the knee downwards, and in our fickle climate ladies, otherwise perfectly dressed, frequently wear shoes which are more for service than beauty. Good subjects for full-lengths are very rare, and as the three-quarter cuts out the ugly and the unnecessary parts, and gives more prominence to the head, it is deservedly popular.

Our clients generally tell us whether they prefer to be sitting or standing, but there is seldom any dictation, and the position or attitude is entirely at the discretion of the photographer. Now, George, I want you to get something new, something different into your work, and the first thing I would point out to you about "posing" is that there should be scarcely any. I am sorry to see that you have learnt all the stock tricks *which we all use at times*, and that there is too much of the hand on the pedestal for standing figures, and the book on the knees for sitting ones, to give your work distinction. Yes, yes, a man does lean on a pedestal, and a lady has been known to sit with a book on her lap; it is just because everyone leans on things or reads books, that these positions must be carefully watched. What we want to see a sitter doing is not what every other human being does, but what only one individual in the world does, or quite a simple action in that slightly different way peculiar to the sitter alone. The more your faculty of observation is cultivated, the quicker will you be to apprehend subtle differences and to show such knowledge in your work. Still, when you simply *have* to fall back on one of the old stock poses, make a feature of the lighting, and take great care over the expression.

Mind you, George, I don't want you to run away with the idea that I have a contempt for the methods of the old photographers. Behind the stereotyped posing of the early cabinet photographs, there was frequently a wealth of artistic knowledge. I can honestly say the same of the work of a few "cheap men" in the business, men who have, although making no great pretensions, all made comfortable incomes out of photographs that are a little different from "the usual thing." I look upon the making of portraits as the literary man regards the writing of a story. One who can only write about the fair hero, the dark villain, wedding bells, and the well-worn situations has no chance of success. Similarly, the photographer who serves up year after year the "conservatory" or the "library" (with the same stone accessory), never draws a blind, and seldom changes a case, is something of an optimist if he hopes to get a living out of such work. Now, I'll stop philosophy for a bit, and proceed to the prac-

tical. Bring Joe out of the dark-room, and we'll use him as a model.

Now, Joe, my lad, just stand down there. Look at him, George, both hands in his own pockets! That shows his inexperience and youth, doesn't it? Keep as you are, Joe. Now, what fault have you with this, George? Quite right, he is far too wooden, and the composition is the same at each side. Ah, no, no, don't move the sitter. Why do that, when you can get the same result by moving the camera? Get it firmly into your head, George, that the last thing you should do with a sitter is to "handle" him. If you have a fine, wide room like this to work in, shove the camera about from side to side to alter the point of view. Just here, note the broad principle of lighting involved in the relative positions of sitter and camera. Working diagonally across the studio, with the camera against the side light, the subject is more broadly lit, the scheme is "softer" than the normal. Reverse the procedure, of course without disturbing the blinds, and the composition will have more contrast and something of the "Rembrandt" appearance. I speak of working "across the light" and working "against the light" to indicate where the camera ought to be placed, taking an imaginary line down the centre of the studio as the normal "operating" platform. Well, given a scheme that is just a trifle too flat, working *against* the light will put more shadow and contrast into the picture, while harsh lighting may be softened by working *across* the light, and *every change in the camera's position to right or left means a modification of the lighting.* Always bear that in mind when shifting the camera, instead of disturbing the sitter.

Yes, that's better, now that we get the body a little to the side, and each arm discloses a different set of contours. I see the blinds weren't closed after the last sitter. Substantially the lighting is just about right. Young faces are best, as a rule, without any "effects" in lighting. I think, however, no doubt inspired by the thought of quick exposures, that most of us use too much light on our pictures of children. True, the rounded little faces should not be in a low key, but care should be taken in conserving roundness that we don't get the snub nose and the puffy cheeks reduced to the one plane. Now look at Joe. He's got plump, youthful cheeks, but if I were to let in more front light it would broaden his face, and give the impression that he had a gumboil. You've got that focussed? See that you vignette him off above the knees, George, for the outline of unpressed trousers is best subordinated. A lad of this age and disposition may be encouraged to smile, an expression tolerable in a care-free youth might look quite undignified in a man of mature years. There now, I've exposed that, George; we'll go over it critically in the negative. Don't move away, Joe, I will need you for a few minutes yet. Which leg does a man stand on, George? Seems a funny question, doesn't it; but few persons know how to stand properly, and fewer know by regarding a picture whether the subject is standing on the right or the left leg, or if the weight is distributed equally between the two; and yet, although it is a very simple matter, the student must be in no doubt, otherwise he will continually be at sea in his full-length and three-quarter pictures.

Well, then, a man only stands on one leg at a time, unless a soldier on parade. The leg on which the weight of the body is thrown should be rigid, the other more or less bent. Actors and others who have to consciously study their appearance know how gracefully the body may be carried by thinking of the feet, and photographers should certainly know the rules of deportment.

At the beginning of this morning's talk, George, I counselled you to "pose" as little as possible, and I always try to make the sitter give me the key to the position. As Joe wasn't a bit nervous, he just stood right at once, hands in pockets, the body inclined slightly forward, the head almost straight above the rigid leg. See, he has shifted on to the other foot now, and if we were to take another plate the picture would have a leaning-back tendency—that is, of course, if we didn't alter the head as well. Well, a human being stands on one leg at a time, but does it matter which? Is it arbitrary, or has it any significance?

A clever artist with whom I once lived used to say that he had a definite rule in the matter. "Make a woman stand on her fore leg, and a man on his hind one, and you can't go far wrong," was his advice. Joe was standing on his "fore" leg, but he's not a man yet. There is a great deal in the rule of my artist friend. With the rigid leg in front and the body inclined forward, movement and youth are better suggested than when the subject seems to have sunk back tired on the opposite limb. Now, although the standing problem is of paramount importance with full-length pictures (I shall come back to it again), even in three-quarter lengths the placing of the feet determines the ease or otherwise of the portrait.

A hands-in-pockets picture like this presents few difficulties, but let us just think over a few points common to this and similar three-quarter lengths. An ordinary dark suit possesses little aesthetic beauty, so the aim should be to keep the clothes and background in low key. I need scarcely tell you that a light background shows a dark figure to advantage, and *vice versa*, but one must always be on the alert in practice, and settle each problem on its merits. A world of difference may be made by changing from a very dark to a very light ground, but one must think of the portrait and background as a complete composition. Selection and choice in this respect must be guided by the old test question of disclosing or subordinating. We can go into the "losing and finding" of outlines better with full lengths, so we will defer that to further consideration.

Take your hands out of your pockets, Joe, and sit down somewhere. Look at him, George, in that big chair like a tired old man. That would never do. It only needs a book, and a cathedral light to make a clergyman of him. Stand up again, my lad, straddle one leg over this sofa as if you didn't care a hang about anyone. That's the goods; now take out your cigarette case. No, that packet of fags won't do; I'll lend you my case. Look at that now, George. See how easily he is "posed," how simply the hands are employed, and yet how natural the whole thing is. If Joe ever reads a book, none of his friends see him at it, and certainly I often see him sitting up on tables and benches, when I might be better-pleased if he was doing an odd bit of work, and it doesn't need a Sherlock Holmes to tell that he is addicted to fags. Well, George, in this case, we occupy the hands without any difficulty, and get something like a portrait of a youth. Thank you, Joe, you have done very well. I hope you have been paying some attention to what I have been saying, for I hope soon to take you into the studio with me.

Now, George, you can have those few boxes of plates which I stopped using on account of their slowness. Provided you are always trying hard, and promise to give up the book and pedestal, the front face, and the two-legged portrait, you may experiment away until I further restrict your artistic endeavours

J. Effel.

Photography and Crime.—The important part played by photography in all great criminal cases nowadays is, of course, well known and appreciated, but most people will be surprised to learn (says last Sunday's "People") that the cost of the Bournemouth murder trial in this connection from first to last amounted to between £1,800 and £2,000. This sum included, in the first place, the cost of photographs of the scene of the murder and of the unfortunate victim, and the circulation broadcast of facsimiles of the decoy telegram sent by the murderer, together with specimens of his handwriting.

JUDGMENT AND THE EXPOSURE METER.

[Even when the instructions for the use of an exposure meter are strictly followed, considerable opportunity still remains for the exercise of judgment in determining the exposure to be given under various working conditions. The respects in which due allowance requires to be made are very usefully dealt with in the following article from the "Camera," particularly as regards making allowance for the scale of tones in the subject.]

The difficulty of estimating the correct exposure to give, under varying conditions, is sufficient to account for the number of aids offered in the forms of exposure-meters and tables, but to obtain the maximum help from such guides the user should be acquainted with the factors which affect exposure, which are:—

1. Actinic strength of the light illuminating the subject.
2. Contrast range between lightest and darkest parts of the subject.
3. General tonality or "key"—*i.e.*, whether most of the material is light or dark.
4. Pronounced colour, especially in the immediate foreground.
5. Distance of important parts from the lens, if much nearer or further away than usual.
6. Size of lens-stop employed during exposure.
7. Speed of the plate or film, and its sensitiveness to different colours.

The strength of the light is pretty accurately measured in meters like the Watkins and Wynne type, by noting the time taken for a section of the special sensitized paper supplied to darken to the same shade as the "Standard tint" attached to the dial, this being known as the actinometer time, but in the case of ordinary exposure-tables, or calculators designed on the same principles, where the power of the light is listed under such heads as "intense sunlight," "diffused," "dull," etc., the user must depend upon his own judgment as to just what conditions fit these terms, and opinions are liable to vary considerably if some systematic definition is not applied, the best visual guide being the intensity of cast-shadows in direct sunlight, together with the colour of the atmosphere.

Intense sunlight may be said to exist when the air is very clear and objects in the foreground cast sharp, deep shadows, which present great contrast with the lighted portions of the subject. The term "good" or "bright" sunlight fits when a very slight colourless haze subdues the sun's rays a little, making the shadows somewhat less intense, but still well-defined at their edges. Such headings as "diffused sunlight" and "hazy sun" are applicable when cast-shadows are faint and blurred in outline. "Cloudy-bright" expresses the condition when the sun is shut off from view by broken masses of cloud, preventing direct shadows being cast, yet affording a fair amount of indirect illumination reaching the subject. "Dull" or "cloudy" indicates an entirely overcast sky of a grey blue, while "very dull" should be applied when the sky is of a dark leaden shade, also in the case of twilight scenes, during a snowstorm and when rain is falling steadily. When the atmosphere is more than usually tinged with yellow or orange, for the time of day, the indicated exposures on printed tables can safely be doubled at least, even though orthochromatic plates or films are employed, and even more allowance is essential to prevent under-timing, if ordinary emulsions are being used, owing to their slight sensitiveness to such tints.

Our second, third and fourth factors—contrast, proportion of light and dark tone in component parts and colour vary with the character of the subject and lighting. The intensity and concentration of the latter determines the degree of contrast between the lighted and shadow portions of each object, but the local tone or colour of each part also causes a range of tones besides those due to accidents of light and shadow, and it is a combination of the two, as a rule, which produces the effect observed. A view, containing material of almost uniform local tone-value, appears flat in a dull light, because of the absence of those accents due to the play of light and cast-shadow, whereas one made up of objects of contrasting local tone, say a white house amid a setting of dark foliage, will present a considerable amount of gradation under the same conditions. For these reasons material having a longer scale of local tone than usual will be likely to exhibit extreme contrasts in intense light, particularly when portions of the lightest coloured objects receive the full effect of the sunlight, while parts of the darkest objects remain in shadow. Here is where the direction from which the light comes may entirely alter the tonal scale.

When the scale of contrast is moderate, and the greater part of the subject-matter in an outdoor view is light in tone, it may be classed under such heads as "open landscape" or "landscape with light foreground," even though the principal object is within 10 ft. or so of the lens, but when extremely deep shadows or dark objects fill a noticeable amount of the picture-space, or much of the material is composed of the less actinic colours, such as brilliant yellows and reds in autumn foliage, the same exposure may well be given an open scene as that allowed a "landscape with heavy foreground."

Since beginners are sometimes in doubt how to classify material under certain of the headings commonly used in exposure-tables, the following suggestions are given:—

Average Landscape.—A moderately open section of scenery without any dark masses of foliage nearer than about 50 or 75 ft. from the lens, but with enough material of this sort, or something similar in tonal quality, to fill from a third to one-half the total area of the picture. A street-scene, with light, open foreground and low buildings, also views of a building at a sufficient distance to show the whole of the structure, would come into the same class in the matter of exposure.

Open Landscape.—One with a clear foreground, such as a grassy meadow, and only a limited amount of dark tone in the middle distance, say a 100 yards away, which can practically be disregarded in timing the exposure. Most river and lake scenes in which water occupies most of the foreground area, can be classed the same, also shore views, with dark rocks in the foreground.

Snow, beach-scenes and *shipping* are usually listed as needing but one-fourth the exposure of an average landscape, but this applies only when such subjects have a clear, open foreground, or one containing very light-toned objects, it being assumed any dark material which may be included is at a sufficient distance to cover but a small space in the picture. An exposure, which would be sufficient for snow-covered hills or a distant vessel, will not register detail in the shadow portions of nearby tree-trunks or a ship's hull painted in dark colours, even though the surface of snow and water does reflect light into the shadows, thus reducing their depth; consequently, in dealing with subjects of this type, one should be guided by the area and general depth of the shadow tones rather than the brightness of the high-lights.

Regarding the fifth factor, that of distance between lens and subject, when greatly in excess of the range presented in the different subjects already mentioned. Other things being equal, very distant objects, such as a mountain peak, taken with long-focus or telephoto lenses, which cut out the immediate foreground, because of the narrow view-angle covered, require less than normal exposure owing to the refracted light and semi-opacity of the intervening atmosphere lessening the intensity of dark parts and reducing the general contrast. Very near objects call for extra exposure, not only because of the practical absence of the conditions just mentioned, but the fact that the lens must be racked out considerably beyond

its normal equivalent focus to secure a properly defined image, which, for the time being, reduces the effective speed of any given stop used. Thus, if the distance between lens and plate is once-and-a-half the normal focal length, a stop marked $f/8$ is really working at an effective aperture of only $f/11$, which, as every practical worker knows, calls for twice as long an exposure. Such conditions are always encountered when photographing small objects to a fair-sized scale.

Our sixth factor, the size of lens-stop, is taken into account in all exposure-guides, but subject to an allowance for the change in effective value under the conditions just set forth.

The last factor, speed of plate or film, is a measurable one, within the small percentage of variation in speed of different batches, and every standard brand is assigned a certain speed-number by the makers of meters and tables. Some workers, however, prefer fuller or shorter timing than others, so when the desired results are not obtained by following the listed speed of the plate used, one has merely to choose a lower or higher number to suit personal requirements.

In using meters of the actinometer type, it is important to measure the power of the light correctly, and as the method of doing so varies somewhat with different instruments, the maker's instructions upon this point should be carefully read and kept in mind.

Some people seem to experience difficulty in determining the exact instant when the sensitive-paper reaches the shade of the standard tint on the dial or face of a meter. This is readily overcome by holding the meter at about arms' length and observing the depth of the tint, instead of looking for a perfect match in colour, since there is often a slight discrepancy in the latter, which should be disregarded. In timing the darkening of the test paper it is advisable to hold one's watch alongside the meter, where both can be seen without shifting the eyes, cover the unexposed section of paper with one thumb until the second-hand of the watch reaches the starting point on the dial, then begin the exposure of the paper, and as soon as it reaches the correct depth note the number of seconds taken. Somewhat less care is needful in weak light, since the paper then takes much longer to darken and there is less chance of error creeping in.

A matter which has nothing to do with the correctness of the timing, indicated by a meter, yet may make it inaccurate from a practical view-point when giving shutter exposures of rather short duration, is the light passing efficiency of the shutter, also whether the marked speeds are approximately true, which is not always the case. In fact, the higher speeds of between-lens shutters seldom come up to their rating, but such differences as may exist in shutters, kept in good working order, is offset by the fact that even the best of shutters, working at the diaphragm opening, cannot be 100 per cent. efficient in light passing power for the duration of the exposure, as an appreciable portion of the time is taken up by the opening and closing of the shutter-blades, the practical effect of which upon the volume of light is equivalent to using a smaller lens-stop. As the blades of the best shutters move very rapidly at whatever speed the shutter is set, it is evident that their efficiency is highest on the slower speeds, since the blades then have an opportunity of remaining wide open for a longer time than is the case at a higher speed, where there is only sufficient interval of arrested motion between opening and closing to permit the mechanism to act. The result is that a shutter, which may be 80 or 90 per cent. efficient in light passing power on such slow speeds as 1/5 or 1/10 second, will probably not be better than 60 per cent. at 1/100 or 1/150. As before stated, this loss is very well balanced when the actual higher speeds are not up to their markings, but when using a shutter, whose speeds are known to be accurate, it is a good plan, whenever possible, to figure upon giving more time, or using a larger lens-stop than the meter-reading calls for on brief exposures to guard against loss of shadow detail from under-timing.

WILLIAM S. DAVIS.

THEORY AND PRACTICE OF DEPTH OF FOCUS.

II.

[In the preceding of the present series of chapters the phenomena of vision, which enter into the question of depth of focus, were generally considered. Depth of definition—that is to say, the distance through which the focussing screen can be moved forwards and backwards from a position of critical focus when photographing a flat object—was the subject of short treatment, from which it was shown that this "depth" is always proportional to the working relative aperture of the lens irrespective of its focal length. The present chapter is devoted to the so-called hyperfocal distance, a term which unfortunately has been used in several different senses by writers on depth. In Chapter III. we shall come to the formulæ relating to the furthest and nearest distances (from the lens) to which depth extends when focussing on a given distance with a lens of given focal length and diameter of aperture.]

THE factors which enter into depth of focus are most simply displayed in reference to a condition of everyday importance in hand-camera photography, viz., the degree to which an object (focussed when at a very great distance) may approach the camera without itself becoming perceptibly unsharp in the photograph, and, of course, without sacrifice of sharpness in more distant parts of the subject by altering the focussing.

The term *hyperfocal distance* is used by writers on this subject, but unfortunately in three different senses. It is therefore necessary to show these differences and to explain the meaning which we will attach to this term.

If an object at a great distance (the so-called infinity) be sharply focussed, it is found that, without altering the position of the lens, a comparatively near object is still "in focus," that is, it is rendered without perceptible unsharpness. By the description "in focus," or "without perceptible unsharpness," is meant the reproduction of a point in the nearer object as a disc of admissible diameter. It is the distance of this nearer object from the lens which, by most English writers, is called the *hyperfocal distance*. We will, therefore, adopt this use of the term, and denote it by the symbol H.

Next, let the sharpest focus be obtained on an object at such a distance that objects up to the extreme distance are rendered without perceptible unsharpness. It will be found that the difference between hyperfocal distance and the distance of sharp focus when obtaining infinity without perceptible unsharpness is very small.

Lastly, suppose we find how much nearer to the lens an object may be brought (after focussing on an object at the distance for "focus" at infinity) without becoming perceptibly unsharp. As will be shown, it may be brought almost exactly half the hyperfocal distance towards the lens.

By French writers, and also by some English, the term "hyperfocal distance" is applied to this half-distance. We will call it *distance of nearest "focus" when obtaining equal "focus" at infinity.*

We can now proceed to derive the formulæ for these three distances.

Hyperfocal Distance.

In fig. 4*, $A\,B$ and $C\,D$ together represent the largest pencil of rays from an infinitely distant object point, which passes through the diaphragm $B\,D$ and comes to a focus at Z. $B\,P$ and $D\,P$ represent the image-forming rays bounding the largest pencil from a nearer object having its focus beyond Z, namely, at P. $K\,K$ represents the focussing screen. If, then, the convergent pencil, which has its focus at P,

* For the sake of clearness in this and the succeeding diagrams the aperture of the stop and the disc of confusion are shown on a greatly exaggerated scale.

has a cross-section (of diameter, $G\,G = c$) on the ground glass equal to the maximum disc of confusion, the axial distance of the nearer object from the diaphragm is the hyperfocal distance as above defined.

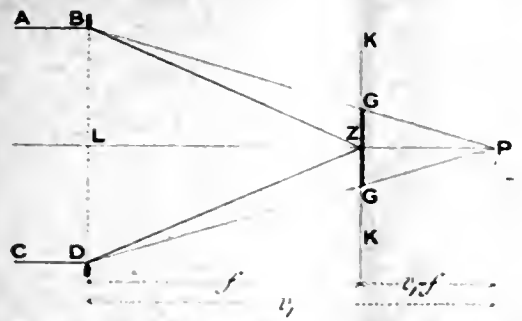


Fig. 4.—Illustrating formation of image of an object at the hyperfocal distance. A pencil of rays $A\,B\,C\,D$ from an infinitely distant object comes to a focus on the focussing screen $K\,K$ at Z. If the cross-section $G\,G$ (in the plane of the focussing screen of a pencil from a nearer object (having its focus at P) is equal to the admissible disc of confusion, the object is at the *hyperfocal distance* $= \frac{fd}{c}$, where f is the focal length of the lens and d the diameter of the stop $B\,D$.

We will use the following symbols for the quantities concerned:—

f, focal length of lens.

d, diameter (effective) of diaphragm.

c, diameter of admissible circle of confusion.

u_1, u_2, u_3, object distances.

v_1, v_2, v_3, image distances.

Thus, in fig. 4, u_1 is the distance of the nearer object from the diaphragm and v_1, the distance of its image.

From the geometrical construction (the similar triangles $B\,D\,P$ and $G\,G\,P$)—

$$\frac{c}{d} = \frac{v_1 - f}{v_1}$$

Since v_1 and u_1 are conjugate focal distances,

$$\frac{1}{v_1} + \frac{1}{u_1} = \frac{1}{f}, \text{ i.e., } v_1 = \frac{u_1 f}{u_1 - f} \text{ and therefore } \frac{c}{d} = \frac{f}{u_1}$$

and u_1, or H, $= \frac{fd}{c}$ . . . . . (4)

In words, *the hyperfocal distance is equal to the focal length multiplied by the diameter of the stop, and divided by the diameter of the admitted disc of confusion.*

Now of these three quantities in the formula, the focal length and stop diameter are determined by the particular lens in use and, within limits, each can be singly and separately varied. On the other hand, the diameter of the disc of confusion is a quantity which, according to the older views on depth is arbitrarily chosen, say, 1/100 or 1/250 of an inch for fair and critical definition. According to the more modern view, it should be a certain small fraction of the camera extension (which, in this case, is the focal length) corresponding with the angle of sharpness of vision.

If we retain the same standard of definition for large and small pictures, then, plainly, the distance of nearest "focus," when focussing on infinity, is separately proportional to the diameter of the stop and to the focal length of the lens. If either of these is halved, the hyperfocal distance is also halved. But, on the other hand, it is in accordance with the conditions of vision that, when using a longer focus lens and getting a larger picture, we can therefore allow a proportionately larger disc of confusion, because the print should be viewed from a greater distance. If, then, in this order of ideas, a larger disc of confusion is allowed proportionally with an increase in the focal length, that is, if c is always to be in the same proportion to f, this distance of nearest focus is singly and solely proportional to the actual diameter of the stop. This was the crux of the controversies which raged years ago, when this latter view of depth was put forward by Mr. W. E. Debenham, some years before it was advocated in a more scientifically developed form by German opticians. In a later part of these articles we shall endeavour to show that formulæ devised from either the modern or older view require modification according to the particular circumstances prevailing in the taking of the negative and viewing of the print.

Formula (4) may be put in other forms. Instead of including the actual effective diameter of the stop, the ratio $\frac{\text{focal length}}{F.\ N^\circ}$ can be used, so that the formula becomes

$$\text{Hyperfocal distance} = \frac{f^2}{F.\ N^\circ \times c} \quad . \quad . \quad . \quad . \quad . \quad . \quad (4a)$$

In words, *the hyperfocal distance is equal to the focal length multiplied by itself, divided by the F. N° and also by the admitted diameter of disc of confusion.* If a standard of 1-100th of an in. be adopted this becomes

$$H = \frac{100 f^2}{F.\ N^\circ} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (4b)$$

Thus, adopting a disc of confusion of 1-100th in., the hyperfocal distance when using a 6-in. lens of *f*/8 aperture is

$$\frac{100 \times 6 \times 6}{8} \text{ in.} = 450 \text{ in.} = 37 \text{ ft.}$$

On the other hand, if it is held that the disc of confusion should be, say, 1-2,000th of the focal length, formula (4) obviously becomes

$$H = 2{,}000\ d \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (4c)$$

that is, the hyperfocal distance is 2,000 times the actual effective diameter of the stop. In a later chapter it will be shown how very simply this last formula follows from considerations based on conditions of vision.

Distance of sharp focus when obtaining infinity in "focus."

This is the nearest distance of an object which can be focussed with critical sharpness at the same time that objects in the extreme distance are rendered by definition consisting of discs of confusion of the maximum admitted diameter.

Adopting the same lettering as in fig. 4 a pencil of rays from an object O at some finite distance u_2 is brought to a point focus P_1 on the focussing screen $K\,K$ (fig. 5). If, now, the pencil of rays $A\,B$, $C\,D$, from an object

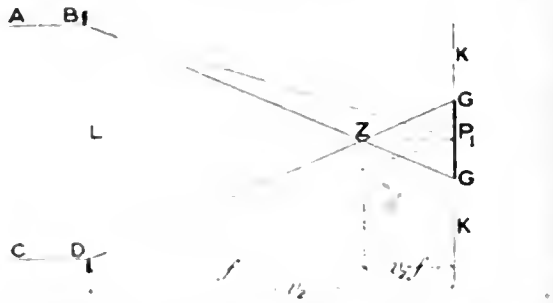


Fig. 5.—Illustrating formation of image of object at distance of sharp focus when obtaining infinity in "focus." P_1 is the sharp image on the focussing screen $K\,K$, of an object at such a distance that a point in an object at infinity is rendered on the focussing screen as a disc $G\,G$ of the admitted diameter c. The distance of the object is $\frac{fd}{c} + f$.

at infinity, forms a disc of confusion $G\,G$ of the maximum admitted diameter in the same plane as the sharp image of O, the distance of O from the stop is the distance, as just defined.

From the construction (the similar triangles $B\,D\,Z$ and $G\,G\,Z$

$$\frac{c}{d} = \frac{v_2 - f}{f}$$

As before $v_2 = \frac{u_2 f}{u_2 - f}$

whence u_2 (distance of the object) $= \frac{fd}{c} + f$ . . . . (5)

that is, the distance is greater than the hyperfocal distance by one focal length of the lens.

It is the theoretical distance on which to focus in order that all objects up to the extreme distance may be without perceptible unsharpness, according to the standard adopted for the disc of confusion, but it differs so slightly from the hyperfocal distance that the latter serves equally well.

Formula (5) may be written:—

$$\frac{f^2}{F.\ N^\circ \times c} + f \quad . \quad . \quad (5a)$$

If, however, we adopt as the standard of the admissible disc of confusion, 1-2,000th of the distance from which the print is, or should be, viewed, that is 1-2,000th of v_1 in fig. 4, there is no difference between this

distance and the hyperfocal distance: each is equal to 2,000 times the actual effective diameter of the stop.

$$u_2 = 2{,}000d \quad . \quad . \quad . \quad . \quad . \quad . \quad (5b)$$

Distance of nearest "focus" when obtaining equal "focus" at infinity.

The distance of an object in critical focus, which permits objects up to infinity to be rendered without perceptible unsharpness, has an important property. From fig. 5 we have found the value it has in order that depth may extend to the extreme distance. Let us now see how far depth extends towards the camera. In fig. 6, as in fig. 5, let

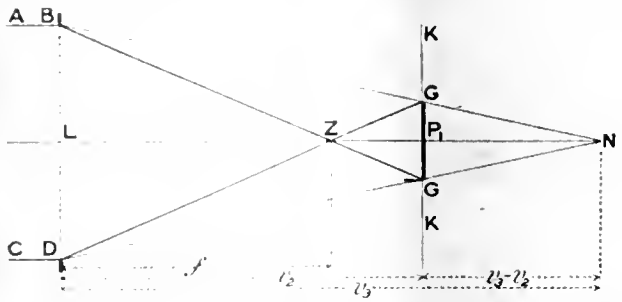


Fig. 6—Illustrating formation of image of object at distance of nearest "focus" when obtaining equal "focus" at infinity.

N is the image of a nearer object at such a distance that the cross-section in the focussing screen of its pencil of rays is also equal to the admitted disc of confusion *G G*. The distance of the object is therefore exactly half $\frac{fd}{c} + f$.

an object point at infinity form a disc of confusion on the ground glass of the maximum admissible diameter *G G*. An object at the distance of $\frac{fd}{c} + f$ is then in critical focus. (For the sake of clearness rays from this object are not shown). Let *O* be an object at such a lesser distance u_3 that rays from it also form on the screen discs of confusion of the maximum admitted diameter. The image of *O* is therefore at *N*, and the distance from *N* to the diaphragm is the conjugate image distance of the required object distance.

From the construction (the similar triangles *B D Z* and *G G Z*)—

$$\frac{d}{c} = \frac{f}{Z P_1}$$

$$\text{i.e. } Z P_1 = \frac{fc}{d}$$

Similarly from the triangles *B D N* and *G G N*

$$P_1 N = \frac{c v_3}{d}$$

But $Z P_1 + P_1 N = v_3 - f$

whence $v_3 - f = \frac{fc + v_3 c}{d}$ and $v_3 = \frac{f(d+c)}{d-c}$

But $v_3 = \frac{f u_3}{u_3 - f}$

Therefore $u_3 = \frac{fd}{2c} + \frac{f}{2}$ . . . . . (6)

This is seen to be exactly one half the distance of sharp focus. In other words, when focussing on this distance, depth extends backwards to the extreme distance and forwards through half the distance focussed on. It is plain from the diagram that this is the greatest extent of depth obtainable and hence in theory the distance according to formula (2) is the best focussing setting for a fixed focus camera. The difference between it and the hyperfocal distance, is, however, so small (one focal length) that the latter serves just as well. Objects up to one-half the hyperfocal distance are then obtained without perceptible unsharpness according to the standard of disc of confusion adopted.

If, as already set forth, a variable standard for the admissible disc of confusion in the print be adopted, e.g. 1-2,000th of the viewing distance, the distance of nearest focus when obtaining equal focus at infinity is 1,000 times the absolute diameter of the effective stop.

The results obtained from the foregoing constructions will perhaps be more easily followed if we put them down in a table.

TABLE II.

1.	Formula. 2.	For disc of confusion of 1-100th of an inch formula is: 3.	For disc of confusion of of 1-2,000th of viewing distance formula is: 4.
1. Hyperfocal distance, viz. distance of nearest "focus" when focussing on infinity	$\frac{fd}{c} = \frac{f^2}{F.N^\circ \times c}$	$\frac{100f^2}{F.N^\circ}$	$2{,}000d$
2. Distance of sharply focussed object such that objects at infinity are in "focus" (practically equal to the hyperfocal distance) . .	$\frac{fd}{c} + f = \frac{f^2}{F.N^\circ \times c} + f$	$\frac{100f^2}{F.N^\circ} + f$	$2{,}000d$
3. Distance of nearest "focus" when obtaining equal "focus" at infinity (practically half the hyperfocal distance)	$\frac{fd}{2c} + \frac{f}{2} = \frac{f^2}{F.N^\circ \times 2c} + \frac{f}{2}$	$\frac{50f^2}{F.N^\circ} + \frac{f}{2}$	$1{,}000d$

For practical purposes, the odd f and $f/2$ in the horizontal lines 2 and 3 are negligible. The formulæ in these lines then become equal, respectively, to the hyperfocal distance and half the hyperfocal distance.

The Two Properties of Hyperfocal Distance.

To repeat, the above table is a reminder of the two properties which, for practical purposes, are possessed by the hyperfocal distance:—

(1) It is the nearest distance of objects rendered with the maximum admissible disc of confusion when focussing on the extreme distance.

(2) It is also the distance on which to focus sharply in order that objects in the extreme distance shall be rendered no more unsharp than the admitted disc of confusion. When so focussing, objects distant half the hyperfocal distance from the camera are also rendered with the maximum admissible disc of confusion.

It is hoped that figs. 4, 5 and 6 exhibit these properties as well as can be done by diagrams based on the image-forming rays conjugate to the actual distances concerned.

The Stop for a Required Hyperfocal Distance.

It may sometimes be required to ascertain the stop to be used in a lens in order to yield a given hyperfocal distance. If, according to formula (4*a*) based on a disc of confusion of 1-100th in., the hyperfocal distance is equal to 100 times the square of the focal length divided by the *F.* No., if follows that the *F.* No. required to give any hyperfocal distance *H* is equal to 100 times the square of the focal length of the lens divided by the required hyperfocal distance, that is:

$$\text{Required } F.\text{ No.} = \frac{100f \times f}{\text{Required } H} \quad . \quad . \quad . \quad . \quad . \quad (4d)^*$$

For example, the stop to be used to give a hyperfocal distance of 50 ft (= 50 in. × 12 in.) with an 8-in. lens and maximum unsharpness of 1-100th in. is:

$$\frac{100 \times 8 \times 8}{50 \times 12} = \frac{6{,}400}{600} = f/10.7$$

At this aperture objects up to 50 ft. from the camera will be in "focus" when focussing on infinity; and objects from infinity to 25 ft. when focussing on 50 ft.

The example serves to illustrate an elementary rule of depth of focus, viz:—

By stopping down the lens (after having focussed on an object) in order to bring infinity into "focus," depth of focus is thereby also extended half the distance of the object towards the camera.

This is only another way of saying that by stopping down the lens to the required degree the distance of the object becomes the hyperfocal

* According to the view that the disc of confusion should be a small fraction, e.g. 1-2,000th of the image (i.e. viewing) distance, the actual diameter of stop required for a given hyperfocal distance of *H* is *H* divided by 2,000 (see Formula 4c).

distance and exhibits the property No. 2 mentioned above. It is a particular case of a general rule in depth of focus of importance in photographing near objects. Consideration of the rules governing this distribution of depth on the far and near sides of the object in sharp focus must be reserved for another article. G. E. B.

(To be continued.)

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION. CONGRESS PROGRAMME.

We give below a few extracts from a communication which has reached us from the P.P.A.:—

Mr. Reginald Haines reports good progress with the Congress programme. The items have a very wide range of interest, and from the rough drafts we are able to give a few advance details. The committee has endeavoured to make as much change from the old style of Congress as possible, inasmuch as the Gallery is the finest and most suitable obtainable in London. From a social point of view it offers every comfort.

The trade exhibits are shaping well, and by what we hear from Mr. Wakefield the room will be unique in its appearance, and offers great facilities of getting right away with the business. There seems to be great enthusiasm amongst the trade exhibitors to give the members something of real interest.

In arranging the programme every consideration has been given to the trade exhibits. Every firm who is exhibiting will be one with us, and we sincerely hope members will appreciate these firms to the extent of always dealing with them. They have come forward and co-operated with us in this unique birthday celebration. Without giving full and definite dates and times these items will be of interest.

Monday Morning (Sept 11).—On the first day all members will be expected to go to the Gallery and sign the register, receive their badge number (registration fee 1s.), and here they can receive any information desired and obtain a complete programme and catalogue for 6d. Beyond these two small official charges all other expenses will be personal. The official opening will take place some time during the day, it depends entirely upon the personage who officiates at the ceremony. The President will deliver his address of welcome after the official reception in the Gallery by the President and Council.

Tuesday (Sept. 12).—The morning will be devoted to visits to several places of interest not yet fixed. After this a friendly lunch will be arranged at the Gallery at 1.30. In the afternoon there will be a very important lecture, and the evening will be devoted to Mr. Juan C. Abel, the general secretary of the A.P.A.

Wednesday (Sept. 13).—It is suggested to visit the National Portrait Gallery, and have the portraits described by one who knows. In the afternoon the trade stallholders intend interesting every member with their new apparatus and methods. In the evening Mr. MacDonald, the great "photographer of men," who again seeks his subjects in New York, but is proud to be a Scotchman, will give us a real treat. He is a man brimful of ideas useful to us all.

Thursday (Sept. 14).—A very interesting trip is being arranged to Windsor Castle by river and motor for this day. The costs will be very moderate. Special facilities are being granted. The evening will be perhaps the most unique feature of the Congress—the entertaining of assistants. It is hoped that at least 300 will be in attendance at this our birthday party to the young life of photography. Music and refreshments will be provided, and a real jolly evening is expected.

Friday (Sept. 15).—The details for this day are not quite fixed, but, among other events, we expect to pay an official visit to the London Salon of Photography. We feel sure this will interest many photographers who have never realised the power of pictorial photography. The annual general meeting must, of course, not be forgotten. It will be the most important official meeting of the Congress, and should be attended by every member. At the meeting the new President will be elected, and the evening devoted to the annual dinner at Prince's Gallery.

Saturday (Sept. 16).—The Royal Photographic Society have invited us to visit their exhibition on this day. This is indeed a welcome sign of the brotherhood of all photography and its vast number of workers.

FORTHCOMING EXHIBITIONS.

August 26 to September 9.—Toronto Camera Club. Secretary, J. H. Mackay, Toronto Camera Club, 2, Gould Street, Toronto, Canada.

September 9 to October 7.—London Salon of Photography. Latest date for entries, August 30. Particulars from the Hon. Secretary, London Salon of Photography, 5a, Pall Mall East, London, S.W.1.

September 11 to 15.—Professional Photographers' Association, Princes Galleries, Piccadilly, London, W. (Trade and Professional). Hon. Secretary, Richard N. Speaight, 157, New Bond Street, London, W.1. Also foreign invitation loan exhibition of professional portraiture. Hon. Secretary, Marcus Adams, 43, Dover Street, London, W.1. Latest day for entries and exhibits, August 31.

September 18 to October 28.—Royal Photographic Society Annual Exhibition. Latest date for entries, August 25 (carrier); August 26 (hand). Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

October 18 to 28.—Portsmouth Camera Club. Latest dates: Entry forms, October 11; exhibits, October 16. Particulars from the Hon. Secretary, C. C. Davies, 25, Stubbington Avenue, North End, Portsmouth.

Patent News.

Process patents applications and specifications—are treated in "Photo-Mechanical Notes."

Applications July 31 to August 5:—

Sensitive Materials.—No. 21,363. Photographic plates, films, etc. T. Thorne Baker.

Instantaneous Photography.—No. 21,253. Obtaining photographs from moving objects. H. L. Cooke.

Aerial Photography.—No. 21,031. Aerial photography. M. N. MacLeod.

Reflex Cameras.—No. 21,474. Reflex cameras. R. G. Matthews.

Cameras.—No. 21,053. Cameras. A. E. Norton.

Developing Apparatus.—No. 21,038. Frame for development of photographic films, plates, etc. Pathé Cinéma Anciens Etablissements Pathé Frères.

Camera Adaptor.—No. 21,244. Adaptor for photographic cameras. E. Snell.

Stereoscope.—No. 21,437. Stereoscope. A. E. Stanley.

Cinematography.—No. 21,223. Cinematograph, etc., projection apparatus. E. N. and J. E. Thornton and R. W. Wood.

Projection Apparatus.—No. 21,227. Apparatus for optically projecting from films. E. N. and J. E. Thornton and R. W. Wood.

Cinematography.—No. 20,851. Cinematographic, etc., screens. H. Dewey.

Cinematography.—No. 21,224. Spool cases for cinematograph, etc., projection apparatus. E. N. and J. E. Thornton and R. W. Wood.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

A Reflector for Studio Lighting.—No. 182,508. (June 14, 1922.)—This invention consists of a whitened, or light tinted, tunnel-shaped reflector, curved, rounded, or polygonal in transverse section as to its side and roof and of sufficient dimensions to permit of the posing or arrangement within itself of the persons or objects to be photographed. The reflector may consist of a framework covered with sheets of canvas, thin wood, metal, or other suitable material, or it may be of any other construction em-

bodying the features claimed as novel in the application. The end of the tunnel behind the sitter is more or less occupied by curtains or a background, the opposite extremity having arranged across it an end-screen or reflecting surface, light in colour and calculated to throw back upon the sitter any needed light that might otherwise escape from the tunnel unused. Such end-screen may actually close in the tunnel end, as shown in fig. 2, in which case it should be furnished with an opening for convenience

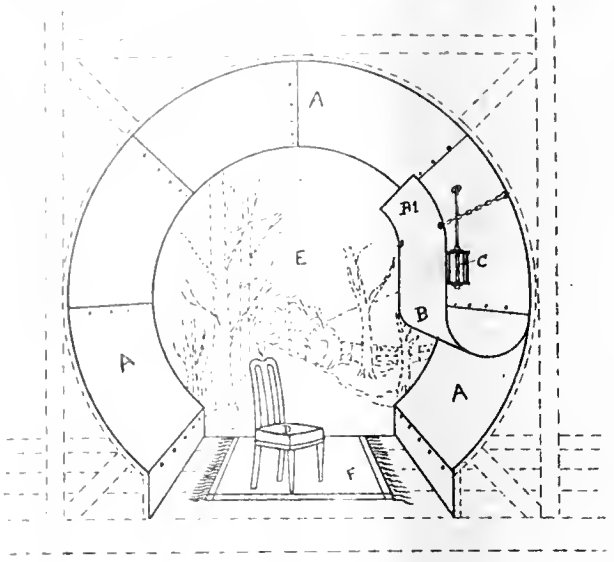


Fig. 1.

of access, or the screen may be arranged at a sufficient distance from the tunnel to admit of persons readily entering the latter. The front-lighting effects produced by the end-screen can be modified by the familiar expedient of having dark curtains slideably arranged in front of the latter in order to reduce or eliminate at will its capacity for reflection.

The source of light, which may consist of one or more arc lamps or of any other approved illuminating appliances, is placed within the tunnel or arranged outside the latter so as to light up the interior of the same through suitable openings or through portions of the tunnel formed for this purpose of a translucent substance. It has been found in practice that the best results are obtained when the illuminant is placed within the tunnel at one side of the same, the sitter being shielded from the lamps' direct rays by a light-coloured screen, opaque or slightly translucent in character according to the effect desired, and curved as to its

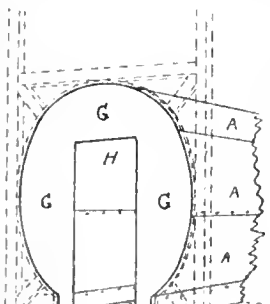


Fig. 2.

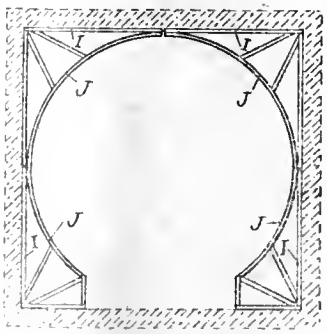


Fig. 3.

free upper portion in a direction roughly parallel with the roof of the tunnel, as shown in fig. 1. Where this arrangement is adopted small parts of the tunnel wall in proximity to the lamps may be made removable to afford access to the lamps for cleaning purposes.

An easily portable form of the tunnel-shaped reflector consists of a set of four rectangular frames, having curved inner surfaces suitably covered with light-coloured fabric, the whole being of such dimensions and transverse section that, upon the frames being fixed, respectively into the angles made by the side walls of a room with its ceiling and floor, as shown in fig. 3, and being used in conjunction with such front lighting reflector-screen as has been already described, the result is to convert that portion of a room so treated into a tunnel-shaped reflector similar in operation to that which is the subject of this application.

Fig. 1 is a front view of a form of the tunnel-shaped reflector A, A, A, with the end-screen removed to show the relation of the above-described lamp screen, marked B and having curved upper portion B1, to the illuminant C and the sitter's chair D. A background E and rug or carpet F are also shown. Fig. 2 is an external view of that extremity of the tunnel facing the sitter, showing an end-screen, G, G, G, in position, an opening H being left for convenient access to the interior of the tunnel. Fig. 3 is a transverse section of a room fitted with four portable rectangular frameworks I, I, I, I, having curved inner surfaces, J, J, J, J, covered with light-tinted fabric and combined to form a tunnel-shaped reflector, as described.—Arthur Thomas Jones, 29, Willingdon Road, Wood Green, London, N.

The following complete specifications are open to public inspection before acceptance:—

Film Cartridges.—No. 183,802. Photographic film cartridges and protective leading strips or backings therefor. Kodak, Ltd.

Reproduction Process.—No. 183,817. Photographic reproduction process. E. Doelker.

New Apparatus.

The Azol and Vedol Thermometer. Sold by Johnson and ons, Ltd., 23, Cross Street, Fiosbury, London, E.C.2.

Thermometers are now largely in demand, because of the ever-increasing number of advocates and users of the time and temperature system of development, and the new pattern introduced by Messrs. Johnson has advantages which will be quickly recognised by all those who are in the habit of developing by time and temperature methods. The firm have for many years issued the most helpful time and temperature tables with their well-known Azol and Vedol developers, tables which have many admirers, as they do much to assist photographers to produce a properly-developed negative.

The thermometer has been specially designed for dark-room use, and when not in actual use for ascertaining the temperature of a developing solution it serves as a useful and ornamental accessory for the dark or any other room. The accompanying illustration gives a good idea of its appearance. The thermometer proper is encased in a stand of polished celluloid, which is easily cleaned and not affected by developing solutions. The conical base enables the thermometer to stand perfectly rigid in flat dishes, and is perforated to permit the solution to come into contact with the mercury bulb, which is so low down that the temperature of even very small quantities of solution contained in measures or flat dishes can be easily and accurately determined. Should, however, it be desired to use the thermometer independently of the celluloid stand, the cap at the top can be unscrewed and the glass tube removed for the time being and then replaced.

The scale goes from zero to 120 degrees Fahrenheit, and the boldly printed figures can, if necessary, be read in the usual red light of the dark-room. The mercury tube is housed so comfortably in the celluloid stand, and so well protected by it, that it may be knocked over or packed up without fear of breakage. It is a most useful accessory, one we have had in constant use during the past week, and remarkable value at 3s. 6d. We need hardly say that although issued for use in conjunction with the Azol and Vedol tables the thermometer serves equally well for others, and for all other purposes in which a thermometer is required.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, AUGUST 21.

Southampton C.C. Informal Meeting.

TUESDAY, AUGUST 22.

Hammersmith Hampshire House P.S. Bromoil. J. Iowatt.
Hackney Phot. Soc. Carbro. E. Baldwin.
Bournemouth C.C. Trimming, and Wet and Dry Mounting of Prints. T. O. B. Norman.

WEDNESDAY, AUGUST 23.

Southampton C.C. Outing to Salisbury.
Exeter Camera Club. Outing to Killerton Park.

SATURDAY, AUGUST 26.

Bournemouth C.C. Outing—Lulworth Cove.
Bradford Phot. Soc. Outing to Leathley.
City of London and Cripplegate P.S. Outing to the Inns of London.
Edinburgh Photo. Soc. Outing to Threipmuir.
Hackney Phot. Soc. Outing to Buckhurst Hill.
Partick Camera Club. Outing to Darnley.
Sheffield P.S. Outing to Stoney Middleton.
South Glasgow Camera Club. Outing to Gleniffer Braes.
Willesden Photo. Soc. Outing to Chenies.

SUNDAY, AUGUST 27.

Hammersmith Hampshire House P.S. Outing to Chesham.

CROYDON CAMERA CLUB.

Mr. A. E. Isaac last week gave a lecture entitled "A Paint Box," which resolved itself into a detailed and interesting review of the composition and permanency of pigments used by artists.

Part of the evening was devoted to a discussion on soft-focus lenses. In the opinion of one speaker the prices asked for the majority, if not for all, on the market were simply ridiculously high. It could hardly be contended that the curves of such lenses required any great precision in grinding. Also, their construction was usually simple and the number of elements few.

Mr. Salt pointed out that diffused definition varied not only in amount, but also in character, which, unfortunately, could not be defined in another sense. A professional member of the club, acting on his advice, had recently purchased a long focus landscape lens, working at f/8 for diffused portraiture, and was delighted with the results obtained. Lenses of this type were made in the past by Taylor, Taylor & Hobson, Wray, and others, and are often on the market at reasonable figures. Practical experience in the studio had demonstrated they were relatively fast—quite fast enough for all ordinary purposes—and the deeply recessed single-lens, being protected from stray light, afforded brilliant but softly modelled pictures.

In reference to diffusion devices now largely employed by the separation of elements in normally highly corrected objectives, Mr. Budd said that on testing some both spherical and chromatic aberration appeared. The softening effect of the former could be seen on the focussing screen; allowance, based on experience, had to be made for the latter.

The previous week had no fixed programme, and may be described as "conversensational." Mr. Ackroyd narrated some experiences in Germany. When joining a char-a-banc trip around Cologne a free-lance photographer snapped the party, and had postcards finished on their return in an hour or so. The cards were supplied for 15 marks apiece, at the time equivalent to 1½d. During his visit the mark fluctuated wildly, and in one case, between lunch and dinner, the exchange rate varied 500 marks to the pound sterling.

The subject of "dark rooms" being incidentally raised, Mr Handel Lucas said he was aghast at the conditions prevailing in a few swanking studios. Damp and filthy cellars not infrequently formed the environment of unfortunate assistants during their working hours, whose health was bound to suffer, and sometimes permanently. Only by combination among them, he thought, could this sad state of affairs be altered for the better, for sanitary inspectors were never on the scene.

Mr. Hibbert said he had never heard of a London County Council inspector entering a photographer's. The assistants were "between the devil and the deep blue sea," for the average assistant's place was easily filled. Mr. Berry was of opinion that the assistants themselves were often responsible for the dirt abounding in some dark-rooms. "You ought to see my dark-room!" proudly confirmed Mr. Taylor. Mr. Sutcliffe, he added, had pointed out in the "Yorkshire Post" that the quality of amateurs' photographic work was almost invariably in inverse ratio to the facilities at command.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A meeting of the Council was held at 35, Russell Square, W.C.1, on Friday, August 11, 1922, when there were present Messrs. A. Swan Watson (President), Alexander Corbett, R. N. Speaight, Arthur Bennett, Frank Brown, W. B. Chaplin, A. H. Ll. Chapman, Gordon H. Chase, Tom Chidley, C. F. Dickinson, W. E. Gray, George Hana, William Illingworth, H. C. Spink, F. G. Wakefield, W. H. Wedlake, and H. D. Halksworth Wheeler, with Alfred Ellis (secretary) and Jenkyn Griffiths (Editor of the "Record"). Mr. Alexander Corbett in the chair.

The secretary read various correspondence which had been carried further as a result of instructions at the last meeting. One matter related to the question of fire insurance, as to which he gave particulars of the terms offered to the Association by two companies. Mr. Illingworth proposed that the Council should accept the offer of the Fine Art and General Insurance Company, and should suggest to the members that they insure with that body. This was seconded, and agreed to. The secretary suggested that the commission of 15 per cent., which was allowed by the company on business done with members of the Association, should go, not into the general funds, but into a social benevolent fund for helping any members in time of need. To do this was permissible under the Articles of Association. To the same fund might be allocated any donations which occasionally came to the Association. Some discussion took place as to whether it would be well to call the proposed fund a benevolent or an emergency fund, and it was agreed, on the proposal of Mr. Hana, seconded by Mr. Wakefield, to call it for the time being an emergency fund.

Among the correspondence arising out of the minutes was a letter from a member complaining that he had given an advertisement to a canvasser for a calendar, which proved not to have anything like the circulation promised by the canvasser, and which did not include a photograph which the canvasser had promised to include. On the suggestion of the President, it was agreed that a paragraph be inserted in the "Record" warning photographers against giving advertisements on promises as to circulation, etc., made by irresponsible canvassers.

The secretary reported that he had arranged with Messrs. Cook and Sons to reserve any hotel accommodation which might be required. Mr. Thomas Bell, of Kodak, Ltd., had agreed to send out with his firm's correspondence 5,000 one-page leaflets asking for new members for the Association. The secretary read a leaflet which he had prepared, and it was approved; it was to be attached to the application form for membership. The President proposed a vote of thanks to Kodak Ltd., for their offer, which was seconded, and carried with applause. Mr. Wakefield said that a complimentary ticket for the exhibition would accompany a proportion of the leaflets.

The secretary stated that the Press agent for the exhibtion had received a letter from the Art Editor of the "Times," asking whether there was to be a section for Press photographers, and saying that he would like to exhibit photographs taken by his own staff. The secretary, after ascertaining the opinions of the chairman and others, had replied that there would be provision in the commercial and technical part of the exhibition for a special section for Press photographs, to which the general and illustrated Press would be invited to send exhibits. The Council unanimously endorsed this action and gave authority to the secretary to proceed with the arrangements, including the offering of medals and the appointment of judges, who were to be well-known men engaged in journalism. The secretary also stated that he had got out a special ticket to entitle the professional friends of members to all the privileges of membership of the Congress (apart from the annual general meeting) for a sum of 5s. This was approved, as were some notices to be published regarding the exhibition. A proposal to issue invitations to certain distinguished persons to attend the opening ceremony was left to the Propaganda Committee to deal with.

Mr. Speaight reported that pictures for the exhibition were coming

in at a fairly rapid rate, especially from abroad. Great interest appeared to be shown in the exhibition by photographers in various parts of the world. In reply to questions, he said that work was being accepted as the work of a firm, not of individual members. Space would be found on the exhibition for the proper classification of colour work if necessary. As to what might be included, the governing condition was that everything must have a photographic basis. Autochromes were not acceptable this year, owing to the difficulty of making arrangements for viewing them, but on a later occasion this might be found possible. He also wished to point out that the judges were not the hanging committee; they simply selected the works on which medals were to be bestowed.

Mr. Chaplin reported on the arrangements for the Windsor outing. Lord Esher had graciously given permission for the party to be conducted through the State apartments and for the group to be taken on the East Terrace. The East Terrace was seldom opened to the public, while permission to photograph a group on the Terrace had been given only four or five times during the last 25 years. It was agreed that Mr. Chaplin should take the group from the East Terrace.

Mr. Wakefield explained the arrangement of stands at the exhibition; all save one had been let. He had had 5,000 tickets printed, and the greater part of them distributed among the exhibitors. The secretary also raised the question of the spending of the sum which had been allocated for advertising, and it was agreed that he should see the Press agent, Mr. Somerville, on the question as to the best way in which this should be spent. Mr. Speaight proposed a hearty vote of thanks to Mr. Wakefield for his very exceptional labours in connection with the exhibition. It had meant the writing of innumerable letters, and an immense amount of business; incidentally also, the postponement of his holiday. The vote of thanks was heartily supported from the chair, and equally heartily carried.

The managing Editor reported on the second issue of the "Record," which had been delayed owing to the printers' strike. He also raised the question of publishing a list of members in the "Record"—a list which would cover 16 pages. The secretary suggested that instead of the list being published in the "Record," it should be published separately in a production the same size as the Handbook, and sold to members at a charge of sixpence, which was agreed to. It was also agreed that the names of members be classified according to towns.

The draft report of the Council, record of attendances, and notice of adjourned annual meeting were considered and approved. On a reference in the draft report to the action of the railway companies on the matter of rates for luggage, Mr. Gray wished it made plain that the concession applied to all companies, not to the Great Western alone, although the correspondence had been with them. It was agreed also to add to the attendances of members of Council the fact that a great many sub-committee meetings had been held, and Mr. Wakefield suggested that in future a record of attendances at sub-committee meetings should be kept. These emendations having been made, the President said that a better report could not have been written. It was likely to impress the members and the public with the extraordinary amount of work which was done by the Council.

The chairman raised the question of the reported granting of exclusive photographic rights to a particular firm of photographers in connection with the 1924 National Exhibition at Wembley Park. It seemed to him an unjust thing that this should have been allocated to one firm, apparently without open tender. The concession included also the selling of photographic goods. It was agreed, on the chairman's proposal, seconded by Mr. Speaight, that the secretary should write to the promoters of the exhibition and ask for details as to the photographic rights.

It was agreed to hold a Council meeting on September 1, and another on the afternoon immediately preceding the annual general meeting. The procedure at the Congress was also discussed, in particular the exact programme for the first day, and the President said that he proposed to take as his presidential address the subject of "Some European Portrait Painters, and Some Tendencies in Modern Portraiture by Photography," which would be illustrated.

The secretary indicated, without actually reading, the correspondence in which he had been engaged during the month. It related to such questions as reproduction fees and commercial prices, insurance inquiries, co-operative advertising, collection of debts, copyright infringement, and this by no means exhausted the list. His replies in all cases was approved.

The following new members were elected:—Mrs. Bentley, Miss Taylor, Mrs. Potts, Mr. Fielder, Mr. Hanson, Mr. Cooper, Mr. Birtles, Mr. Davies, Mr. Bain, Mr. Sayner, Mr. Jenkins, and Mr. H. N. Cooper; also one member rejoining, Mr. Puddicombe.

The business of the Council then concluded, having lasted four hours.

Commercial & Legal Intelligence.

NEW COMPANIES.

Ernest H. Mills, "At Home" Studios, Ltd.—This private company was registered on August 2, with a capital of £3,000 in £1 shares (1,500 "A" and 1,500 "B"). Objects: To carry on the business of photographers, miniature and portrait painters, engravers, makers and repairers of and dealers in cameras, enlarging and optical lanterns and cinematograph projectors, picture and photograph frames and albums, film and plate sellers, developers and printers, photograph enlargers and reproducers, dealers in photographic accessories and requisites, art dealers, studio and lantern and other demonstration room proprietors, etc. The permanent directors are: Hon. Mrs. M. T. Phillips-Roberts, 115, Gloucester Place, Portman Square, W.1.; J. T. Phillips-Roberts, 115, Gloucester Place, Portman Square, W.1, actor. Qualification of permanent directors, 100 shares. Registered office: 185, Piccadilly, W.1.

News and Notes.

Eastman Kodak Company of New Jersey.—The directors of the Eastman Kodak Co. of New Jersey have declared quarterly dividends of 1½ per cent. (being at the rate of 6 per cent. per annum) upon the outstanding preferred stock, and of $1.25 per share, of no par value, of common stock, payable on October 2 to stockholders of record on August 31.

Houghtons, Ltd., have issued a very attractive window bill or poster as an advertisement of their Ensign cameras and films. The poster, which is beautifully coloured, measures about 30 ins. by 19 ins., and represents the figure of a very pretty girl (in a red head-dress, white jumper, and blue frock, stockings and shoes) carrying an Ensign camera. Any dealer who has not yet received a copy would do well to communicate with Messrs. Houghton.

Historic Lenses.—We are informed that Mr. Will Day has been successful in obtaining for his collection of apparatus relating to the cinematograph industry, which will shortly be on view at the South Kensington Museum, the original Dallmeyer R.R. lens, which was used extensively by Edweird Muybridge in his experiments in connection with the production of a moving picture. Mr. Day has also obtained the first Dallmeyer cinematograph projection lens which was manufactured in 1904.

Mr. H. J. Kraushaar has been elected a Fellow of the Incorporated Sales Managers' Association of the United Kingdom, the election carrying with it the right to use the letters F.S.M.A. Mr. Kraushaar has been advertising and sales manager of the firm of Thomas Illingworth and Co., Ltd., of Willesden, for about twelve years, and a member of the Association since 1913. We congratulate him on receiving this honour from an Association which is doing so much good work in the world of commerce.

Parcel Post to New Zealand.—A correspondent who is attached to the dispatch department of one of the leading photographic firms, writes as follows: "There has been a tiresome restriction concerning the size of parcels that may be sent by post direct to New Zealand, and it has been announced by the Postmaster-General that the restriction is imposed not by the postal authorities, but by the steamship companies which carry the parcel mails on the direct route. Although the dimensions of post parcels sent by the direct route to New Zealand will remain 4 ft. for the combined length and girth, the Post Office has now arranged to accept parcels measuring up to 6 ft. combined length and girth, for conveyance

via Australia, at postal rates that are only slightly higher than for parcels sent direct. The limit of weight will be 11 lbs.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.—We learn from the current issue of the "B.P.S. Journal" that Lieut.-Colonel P. Docker has resigned the hon. secretaryship of the Birmingham Photographic Society, and that Mr. J. E. Breeze, of 178, Broad Street, Birmingham, has been appointed to the post. Mr. Docker was hon. secretary prior to the war, and relinquished office, temporarily, on joining His Majesty's Forces. On his return, when the fortunes of the Society were at their lowest ebb, he resumed the secretarial duties with characteristic energy, and the flourishing condition of the B.P.S. to-day is mainly due to his efforts. Mr. Docker has recently been appointed to the command of the 8th Battalion Royal Warwickshire Regiment, and the duties in connection therewith make it impossible for him to any longer fill the post he has so long occupied with such success.

EMPIRE PATENT RIGHTS.—The report of the conference of representatives of the Patent Offices of the Dominions, which was held in London during June last, has been issued by the Stationery Office, price, post free, 1s. 1d. The conference, which was held to consider the practicability of instituting a system of granting patents which should be valid throughout the British Empire, agreed that a British Empire patent, or, in other words, a patent which would be operative throughout the Empire, would be desirable, provided it in no way affected the autonomy of the Dominions and India, or the rights and facilities which an inventor at present enjoyed in those countries. With this object they decided on a scheme for the establishment of a central office for the reception and examination of applications for, and the grant of, patents. Until it should be possible to introduce the full scheme a provisional scheme was adopted. The conference was of opinion that whether or not the schemes suggested were found to be practicable, it was of the highest importance that both the procedure and practice in respect of the grant of patents should be uniform throughout the Empire.

Correspondence.

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

*** *No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

"OPERATOR" OR "POSEUR"?

To the Editors.

Gentlemen,—I would like to express the great pleasure I had in reading Mr. Effel's treatise on portraiture. After being closely acquainted with many studios of various calibres and styles, I think his dissertation is the best thing I have come across, though I fancy it may give rise to some controversy. All for the good of the profession however.

There is one thing I must comment on. The need for a new term to replace "operator." Might I suggest the word "poseur," meaning one who poses and pronounced like "pozer," but with emphasis rather on the last syllable. This would be more appropriate and sound better than operator, which is only suitable for the man who manipulates the camera. If Mr. Effel, whom I have not the pleasure of knowing, will take up this word, or any other, and use it exclusively in his present series, it may be the means of breaking down the conservative, glued-in position of the unwanted term.—Yours faithfully,

J. R. H.

Liverpool.

SYSTEM IN HALF TONE OPERATING.

To the Editors.

Gentlemen,—Replying to Mr. Bull's letter in your issue of July 28, I appreciate his remarks, and agree with him entirely as to the necessity for further careful work for quantitative results to be obtained, and I would suggest that Bolt Court School is the right place for such work to be carried out.

I have done my best to point the way in which half-tone operating can be simplified, and I consider that there my duty to the trade ends, my own firm having first call upon whatever may be the outcome of my experimental work.

Either I did not explain myself clearly or Mr. Bull has not quite caught the spirit of my article of July 14, when he states that I say that the visual diffraction halo is the *cause* of the difference in working separations with coarse and fine screens. What I have tried to convey is that these halos are indicators from which the difference can be calculated. How this diffraction pattern affects what happens in the focal plane is still to be discovered, and if Mr. Bull, with his greater scientific knowledge, cannot see any explanation, I would not venture at this stage to suggest one. The formation of the dot is a complex problem, and cannot be explained by any simple formula. There are three principal factors to account for, the dioptric projection of the lens, the pinhole image of the diaphragm projected by the screen opening, and the disturbing influence of diffraction at some stage of the operation, and these factors do not all act proportionally throughout the whole scale of gradation.

I have read up everything I can find on the subject, but cannot find anything which accounts for the difference in screen separations, and as the visible halo does provide the missing factor, I am content to make use of it.

There is one thing which reacts for or against progress in any industry, and that is the attitude of the industry concerned, and it so happens that vested interests and tradition are not strongly in favour of progress in the photo-engraving industry. The law of the survival of the fittest will probably solve the problem eventually.—Yours faithfully,

E. A. BIERMAN, F.R.P.S.

THE CAMERA AND THE CUSTOMS.

To the Editors.

Gentlemen,—There have been several references in your pages to the question of what one may or may not do in the matter of bringing cameras, etc., into this country from the Continent in general and Germany in particular.

It may therefore interest you and your readers to know that last Friday, the 11th inst., the Foreign Office issued some warnings to travellers entering or passing through Germany with regard to German laws.

With certain exceptions they may take no articles out of Germany unless they have received export licences for them.

The exceptions are:—

Articles brought by them into Germany.

Second hand articles purchased in Germany and required for use during the journey.

New articles bought in Germany and required for use during the journey.

Travelling souvenirs and the usual travelling presents, valued at less than 1,000 marks. All such articles must be voluntarily declared.—Yours faithfully,

A TOURIST PHOTOGRAPHER.

PHOTOGRAPHING FLOWERS.—When photographing blooms cut from the garden, you oftimes find between focussing and exposure they have drooped quite a lot (says a writer in the "B.P.S. Journal"). Flowers will last longer in water and will not droop if the following notes are followed. Gather rosebuds in the evening, just as they are about to unfold; they will open perfectly indoors next day. Sweet peas keep erect longer and also retain their perfume and delicate shades if picked in early morning before the dew has left them. Many people think Shirley and other poppies will not keep well in water; if gathered first thing in the morning these flowers will not droop and will last quite a time if the ends are charred in a flame before putting in water. It seems a funny treatment, but you need only try it to find how satisfactory it is. Flowers like daisies, such as marguerites, asters, chrysanthemums, dahlias, etc., do not expand well in water; these should be gathered when fully opened and the sun is absent. Gladioli and lilies should be picked in late afternoon. These should not be put into water at once, but placed aside for about twenty minutes, then put into water, and they will pick up wonderfully. Gladioli will last a fortnight and bloom from the bottom bloom right to the topmost point; pick off the spent blooms as they wither.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

S. E. J.—The list price of the Cadett shutter of the size you mention was about 25s. You must base your own selling price on this.

C. B. A.—(1) Our contributor informs us that the lens used was a No. 3a of 8 ins. focus, covering a half-plate; the size of the flange is 1¾ ins.

H. G. W.—The value of the lens in question depends upon its quality. It cost from £8 to £10 twenty-five years ago, and would perhaps fetch half that price now.

Y. A. S.—The amount of iron necessary for a barrel of 25 gallons capacity is said to be 7 lbs., which should be suspended in the centre of the barrel. The greater the amount of surface exposed to the solution the better; that is to say, a plate of iron is preferable to a block, and hoop iron is specially recommended.

B. J. P.—The firm inform us that they are unable to quote for or supply materials for the making of opalines. The process is now out of date, and Fallowfield, we understand, cleared out their stock about ten years ago. We are informed that the materials are no longer obtainable from any source. Why not take up the more up-to-date passe-partout?

M. M.—Your trouble is apparently due to the fading out of the red pigment, which has left the white too prominent. We would advise you to write to Messrs. Winsor & Newton, who are always glad to be helpful in such cases. Rose madder is the most permanent of the pink reds, but it is not by any means safe. The firm would probably suggest colours which would stand exposure to light well, even if not quite so effective at first.

D. J. W.—You can certainly use the ferrotype plates or postcards in an ordinary camera, and the results should be even better than with the special apparatus. The developing and fixing is usually done in one solution, which you can buy ready for use. You hardly require a dark-room, a box with a sleeve so that you can transfer the plate from the slide to the developer which could be contained in a jam pot is all that you would require.

H. H. Y.—If your lens is that originally supplied with the camera it is a cheap single achromatic with an initial aperture of f/10. The numbers of the stops do not agree with any standard system. Generally speaking, we should advise you not to waste money on altering the lens, but to buy a quarter-plate rapid rectilinear in Unicum shutter. This, with a focussing scale and view finder, would enable you to make exposures in the hand.

K. E.—Messrs. Dallmeyer have an instantaneous shutter suitable for a No. 4 Series I Stigmatic, viz., the Packard-Ideal shutter. This is made up to 5-inch opening and can be had time only, say ¼-second and up, or with instantaneous adjustment which would, in the large size, work from about one-fifth to 1-20th of a second. We have had considerable experience of these shutters, and can recommend them as quite reliable. For details of size and price see pages 768 and 788 of the current "B.J. Almanac."

S. C. L.—It appears that your heat is not great enough to get the silver fluid hot enough for all the dross to separate. A method which requires rather less heat is to roast the sulphide on an open pan over a fire until it reaches red-heat and is fused into a smooth mass. Powder this, and to every fourteen parts add sixteen parts of a flux composed of carbonate of potash, 3 parts, and carbonate of soda, 2 parts. Half-fill the crucible with the mixture and expose to a red heat. Pour into an iron mould which has been polished with plumbago.

A. D.—We do not think that brass taps would be detrimental to the solutions, but fear that the hypo solution would be detrimental to the taps. Why not buy stoneware taps, which you could procure from Doulton & Co., Ltd., Lambeth, London, S.E.1. Marine glue, composed of asphaltum and indiarubber, or a mixture of red and white lead in linseed oil, are good cements for the joints; as little of this as possible should be put in the joint before screwing up. The tanks will stand better if they are not varnished in any way. A lead lining is advisable for the hypo.

M. E. T.—You can remove most of the tarnish from the bromide print by rubbing gently with cotton wool soaked in methylated spirit. If you then apply a polish of 1 oz. white wax dissolved in 1 oz. benzole, just as you would polish furniture, it will protect the surface in the future. Of course, any spotting or working up must be done after the spirit and before the wax. Messrs. Eveling & Tress, Ltd., 4a, Rathbone Place, Oxford Street, London, W.1, or S. Bruley & Co., 94, Charlotte Street, Fitzroy Sqnare, London, W.1, will furnish cut-out mounts to order.

G. W.—The most suitable lamps for projection work are the small ones used for motor headlights, as in these the filament is concentrated, but these are only made to work on the low voltages given by the car's generator. We have used 10 ordinary half-watt lamps of 120 c.p. by putting a piece of ground glass as near the lamp as possible; this destroys the image of the filament. If you do not mind the little extra attention needed, the small enclosed "Westminster" arc lamp, which is made specially for lantern work, is highly satisfactory. It is especially valuable for somewhat dense negatives.

S. A.—The change of illuminant has nothing to do with the poor colour of your postcards. This is caused by insufficient development, either by reason of too short a time or the use of a weakened developer. To get a good black development should not be for a shorter time than 90 seconds, the exposure being regulated to suit this time. Amidol developer does not remain active for long after mixing; three days is practically the limit. It is sometimes recommended to keep a stock solution of sulphite and add the amidol as required. This is quite the wrong way, as the sulphite solution will not keep well.

L. T. B.—The tone depends largely upon the quality of the negative and the make of paper used, and we advise a little experimenting with really good negatives and a few different makes of paper. The formula you require is: Ammonium sulphocyanide, 20 gr.; gold chloride, 2 gr.; water, 20 ozs. Dissolve sulphocyanide in half the water, and gold in the remainder. Add gold solution to sulphocyanide solution in ounce lots, and let stand 24 hours, or use hot water when mixing, and use when cold. If your negatives are good and not too thin this toning bath should give the tone desired. Fix in an alkaline hypo bath, and afterwards wash in the usual way. Tone well and allow for the reduction which takes place in the hypo bath.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3251. Vol. LXIX. FRIDAY, AUGUST 25, 1922. Price Fourpence.

Contents.

SUMMARY.

Many useful hints on the avoidance of reflections in framed pictures, spectacles, glassware, silver, etc., are given in a contributed article on page 453.

The semi-metallic tarnish, which is liable to make its appearance on black bromide prints on exposure of the latter to the air of ordinary rooms, appears to be due to a partial sulphurising of the silver image. It can be easily removed with ordinary india-rubber. At the same time the fullest possible fixation of the prints, preferably in two or three baths in succession, appears to be of some benefit in preventing the production of this "bloom." (P. 502.)

For prevention of fogging of plates or papers there is perhaps no more effective means than to isolate the fixing solution in a sink of its own provided with a tap by which negatives and prints, as well as the photographer's hands, can be fully rinsed before they are brought in contact with anything else. (P. 502.)

In a further communication Mr. J. Effel deals with the important problem of spacing and sizing the picture. (P. 505.)

For the development of a large number of plates, some of which may be over- and some under-exposed, a two-dish or two-tank method is of great advantage in saving time and obtaining on the average the best results from the exposures. (P. 502.)

Now that many lantern-slides are being made in anticipation of the winter lecture season, it is appropriate to draw attention to the preventive measures which can be taken against dewing of the slides on the screen. (P. 501.)

In a further instalment of the present chapters on depth of focus there is shown the derivation of the formulæ from which can be ascertained the distance (from the camera) to which depth extends behind and in front of a point which is sharply focussed when using a lens of given focal-length and working aperture and when adopting a given diameter of disc of confusion. The formulæ assume a somewhat simpler shape when the disc of confusion is taken as a certain small fraction of the distance from which the print or enlargement should be viewed. (P. 507.)

We look with suspicion on the offer for sale of secret formulæ, and in a paragraph on page 501 suggest a test to which a vendor of a genuine formula could scarcely object.

Some novel methods of displaying cameras with the idea of increasing sales during the autumn will be found on page 508.

The renovation of Daguerreotypes and many other matters are dealt with by writers in our "Correspondence" pages. (P. 513.)

EX CATHEDRA.

Dewing of Lantern Slides. The approach of the autumn season, with its arrangements for lantern lectures in the winter, may be our excuse for referring to the need of greater care than appears often to be taken in preventing the dewing in the lantern by which so many exhibitions of slides are disfigured on the screen. It still appears to be thought by many lanternists and slide-makers that this dewing is caused simply by condensation of moisture on the outside of a cold slide when the latter is placed in the warm stage of the lantern. Hence it is thought that if slides are warmed beforehand all will be well as regards the absence of dewing on the screen. But our experience is that dewing arises within the slide from the presence there of a damp gelatine film. It will be found that slides may be warmed above the temperature of the lantern stage, and will still dew, whilst, on the other hand, they may be colder and will still scarcely dew at all. The latter condition is obtained only when the film is perfectly dry, for which reason the slide-maker should take particular care in this respect when mounting them with their cover glasses, and preferably should varnish them. Cold varnishing (after the slides have been baked bone dry) is now so conveniently done that there is no reason for avoiding it. The mask also should be dry, which is an argument against the use of masking strips, applied with a moistened adhesive, instead of a single cut-out

* * *

Formulæ Mongers. It is difficult to find anything good to say of the practice of offering for sale secret formulæ for some photographic process. If the formula for, say, a toning solution or a fixing bath is offered on the customary terms that the purchaser shall not disclose it to anybody, a reasonable inference is that the preparation is not worth putting on the market for sale on its merits. For the financial return from the sale of a formula must usually be very small compared with that from the supply of the preparation itself, assuming that the latter has real merits to its credit. In our experience formulæ are sold chiefly to the ignorant and undiscriminating, and that is not surprising, since the opportunity for fraud which is within the law lies so ready to hand. It should be realised that a formula which is offered at a price from a few shillings to many pounds may be found in substantially identical form in many of the text books. In some cases it may differ from existing and well-known formulæ for the same purpose by the inclusion of some uncommon chemical, the presence of which, however, is entirely without effect. The vendor supplies what he offers, and if people are silly enough to accept his statements on his own valuation, the law, unfortunately, does not provide them with a remedy. It may perhaps be thought that the offering of formulæ for a few shillings is a minor and harmless

species of trading which does not justify such cautions as we have just written. But within the last twenty years cases have come under our personal observation in which formulæ have been sold for a sum aggregating hundreds of pounds, yet have proved completely useless to the purchasers. In considering such offers where any substantial sum is at stake there is one course which should invariably be taken. Let the vendor be asked to submit his formulæ in confidence to an agreed independent expert, with the request that the latter shall answer the questions: (1) Is the formula substantially novel? (2) If so, is its novelty of any advantage? and (3) Is the formula of probable commercial value? If the offer is genuine, the vendor cannot reasonably object to this course. If, on the other hand, money has been paid for a formula which proves to be valueless for one reason or another, resolute legal action will sometimes bring the vendor precipitately into a subdued frame of mind. The publicity of the County Court is the last thing the formula monger desires to obtain.

* * *

Hypo Infection. We are afraid that the text books do not go far enough in their cautions against allowing hypo to stray from its proper place in the dark-room, namely the fixing bath. We are very properly told to avoid splashing hypo solution into the fixing bath, but where a large output of negatives or prints is handled, often by assistants of none too meticulous habits, it is necessary to arrange matters so as to make that almost impossible, and also to induce a method of working which removes the opportunities of contaminating the developing with hypo. The item of equipment of the dark-room, which is of chief importance in this respect, is a sink of ample size to accommodate the fixing baths; a sink, moreover, provided with tap and waste pipe so that negatives or prints may be rinsed from the fixing bath. This sink should be a few feet distant from the developing dishes, and it is all the better if the space above part of it is screened off by a pair of partitions. A diffused white or light yellow light within this shelter thus allows of the density of negatives being judged without scattering hypo droppings on the developing bench, as must be done if only one lamp is available in the dark-room. In short, once negatives or prints have entered the fixing bath, the next and only convenient route for the surplus which adheres to them on removal from it should be down the waste pipe of what we may call the fixing sink, with the help of plenty of water. Under these conditions it should be difficult for the careless to scatter hypo in those parts of the working space where it ought not to come. A further merit of the arrangement is that the hands may be freely rinsed from hypo and the dark-room towel kept for its proper purpose of drying. Too often it is simply a mopper-up of hypo and a distributor of this chemical to everything which afterwards touches it.

* * *

Two-Solution Development. The practice of developing by time for a fixed period has gained so firm a hold during the last few years that one may assume the existence of a younger generation of photographers among our readers to whom the many past methods of "tinkering" with the developer are unknown. Just as well, perhaps; more correct exposure, greater latitude of plates, and printing papers for negatives which formerly would have been scrapped have done their work, so that the cherished methods of, say, ten years ago tend to be entirely forgotten. Nevertheless, it may not be without advantage to bring to the notice of the holiday-maker who has returned with, may be, some dozens of exposed plates, the advantage of a method of development which goes far to compensate for errors of judgment in exposure. Briefly, the method is to provide two grooved tanks of developer, one containing a weak developing solution of the kind which brings up detail quickly and density more slowly, and the other one which in these respects is the opposite of the first. It is easy to judge from the appearance of a plate after a few seconds in No. 1 if it had better be left where it is to receive the best treatment for under-exposure, or, alternatively, should it come up quickly, if it should be transferred to No. 2. If the fault has been over-exposure, plenty of time in No. 2 will make the best of it. There is no magic in the choice of the formulæ for the two solutions. We have used 1:30 Azol for No. 1 and an ordinary pyro-metol developer for No. 2 with much satisfaction.

BLOOM ON NEGATIVES AND PRINTS.

THE lasting qualities of properly made prints on emulsion development papers may reasonably be said to have justified in course of years the name which was applied at about the time of the introduction of this class of paper, namely, "permanent bromide." So far as fading from internal causes is concerned, there is no reason to regard developed bromide or gaslight prints as other than highly permanent, so long as fixation has been thorough and washing ample. If these conditions are observed, about the only form of deterioration which such prints undergo is one which arises from the circumstances in which they are kept, and takes the form of a semi-metallic sheen, particularly noticeable over the surface of the darker part of the image. This defect is sometimes spoken of as "oxidation," but it is almost certainly a form of sulphurisation arising from a partial sulphiding of the silver image by traces of sulphur compounds in the air to which prints are exposed, or in, for example, paper with which they lie in contact. The sheen, in fact, corresponds with the tarnishing of silver, which is noticed in the case of ordinary articles of domestic use composed of this metal. From the fact that in a bromide or gaslight print the silver image is held in a coating of gelatine, the film of sulphide which thus forms in the course of time is superficial, and can be readily removed by rubbing. Ordinary indiarubber serves to clear it away with reasonable ease, leaving the print practically in its original state. A mildly abrasive preparation, such as that sold as "Frictol" by the Vanguard Manufacturing Co., serves the same purpose as well, if not somewhat better. Uranium-toned prints are particularly susceptible to change of this kind, and the prevention of the bronzing in their case, as well as in that of an untoned print, by the application of a thin coating of celluloid varnish, shows that the defect arises from some action of the air, and not from decomposition within the print itself due to faults in its production.

Nevertheless, the processes used in the making of the print, or rather the degree of perfection with which they are carried out, do appear to have some effect in the occurrence of this bloom in the course of time. In the case of a number of prints made on the same paper on different occasions, some, in our experience, have exhibited the appearance of the bloom, whereas others have been free from it. So far as we can judge, the cause for these differences is simply the degree to which a print is "completely" fixed. We say "completely," because it would seem that when the fullest degree of fixation has been carried out, there still remains a minute residue of silver (other than the silver image) in the

print, and it is the quantity of this residue which determines the greater or less time which may elapse before a print exhibits this semi-metallic sheen under given conditions. It should be made clear that we are not referring here to fixation which in the ordinary way could be called incomplete, that is to say, such fixation which would leave readily decomposable hyposulphite compounds of silver in the print. Such incompleteness of fixation makes itself evident within a very short time by the occurrence of brownish or yellowish patches, the ordinary fixing stain. But, on the other hand, more can often be done than is commonly the case in the handling of fairly large batches of bromide prints to remove the last traces of silver which are removable by hypo. In the early days of bromide paper the common practice was to use a single 10 per cent. solution of hypo for fixation. Of late years the tendency has commendably been in the direction of the use of a much stronger fixing bath, 25 per cent. or 30 per cent., and, moreover, the use of two such baths in succession. In our opinion this ultra-full fixation is well worth while, on account of the greater degree of immunity from the bronzing with the lapse of time, although this latter seems inevitable if sufficient time is allowed and if the ordinary conditions, *e.g.*, exposure to air, apply to the circumstances in which the print is kept. There are, we know, many photographers who now religiously pass prints through two and in some cases through three fixing baths in succession. So far as the immediate permanence of the prints is concerned, they are no doubt doing more than is really necessary, but they may be assured that this meticulous care is not wasted from the point of view of producing prints which shall retain their pristine quality unimpaired for a long term of years.

ON THE AVOIDANCE OF REFLECTION MARKINGS IN NEGATIVES.

Reflections of surrounding objects are the bugbear of the commercial operator. More or less distinct images, usually much distorted, of studio and camera are to be seen in every curve of polished objects. Shop-windows often are a source of great tribulation. The copying of pictures, whether under glass in a gallery, or oil-paintings with their varnish and projecting lumps of shiny paint, is another case in point, as is the more familiar copying in the studio or workroom of semi-matt prints, or of glossy ones which will not lie flat.

In this latter work the writer regrets to state that he has many times seen assistants in great trouble with reflections even in prints which are perfectly flat, and this fact is due to the very happy-go-lucky, rule-of-thumb methods of training (?) which, unfortunately, are still very common in the profession. Even the studio portraitist experiences difficulty at times with the sitter who wears glasses, while in a great many subjects that come before the camera there are less noticeable reflections which mar the result, while not making the source of the degradation so obvious as in the cases specified.

There are cases where reflections are absolutely unavoidable, but in the vast majority of subjects they may be either avoided or modified so as to render them less objectionable. In some cases the reflections may be made to improve the result, and those in which nothing at all can be done in either direction are very few indeed.

It is the object of these notes to show how the source of the reflections, not always very obvious, may be easily discovered, and, having found the origin of the trouble, how to remove or to modify it according to the subject in hand.

It is so easy to dismiss the whole question with the axiom that "the angle of reflection is equal to the angle of incidence," but in practice that principle can be used only in a very rough and ready way, and when one is handling objects containing many curved surfaces it is no help at all. Let us first take the simplest case of all, that of copying from a flat print pinned on the copy-board. Patches of brilliant "grain" are seen in the negative that may not have been noticed on the ground-glass. For one thing it is poor economy to employ glass so coarsely ground that a fault of this kind cannot be instantly recognised. A new focussing-screen is cheaper than a couple only of spoilt plates, to say nothing of the time spent in repeating the job. These shiny patches are nothing but reflections of the source of light broken up by the texture of the print itself. While obviously the light must shine upon the print in order to illuminate it for photographing, there is no reason at all why these patches should ever occur. In order to avoid them it is necessary first of all that the camera should be always quite at right-angles to the copy-board and to arrange the lights in such positions that their actual images will never be reflected from any part of the board into the lens. Having determined this position by the means about to be described, the lights must be either permanently fixed or some arrangement must be made whereby the conditions may be exactly repeated at any time. To discover the proper positions for the lights—really quite a simple matter—it is advisable to insert a fairly short focus lens in the camera which then is focussed so as to include the whole board on the screen. The lens and the focussing-screen are then removed from the camera. The lights having been arranged at such a sufficient distance from the board as to illustrate it evenly, a mirror is held by an assistant flat against the copy-board, while one looks through the camera from behind. In the middle of the board nothing will be seen in the mirror but a reflection of the camera front, but on moving the glass towards the margins of the board one may observe the image of the light itself at some point or other. When this is so, the lamps should be moved outwardly in a line parallel with the board until their images can no longer be seen in the mirror wherever this may be placed (always keeping it flat against the board, of course) from any point at the focussing frame of the camera while looking at the board through the latter. If the lights are then screened so that the camera front itself is not sufficiently illuminated to cause a reflection to be seen, no trouble of the kind described will ever occur, unless a print to be copied is buckled in any way. In such cases as this a refractory print may be placed in the dry-mounter for a few seconds to flatten it. If it has become creased, and has not been mounted, the trouble may be overcome by well wetting, and by putting down upon glass in the case of glossy paper. If, on the other hand, it is a matt print, it may be laid face up, after soaking, upon a waste piece of glass, and having drained a little while, strips of gummed paper may be stuck down all round it, just catching the margins of the print. In drying the paper will try to contract, and it will dry perfectly flat and in good condition for copying. If the surface must not be wetted, the same result may be gained by repeatedly moistening the back with a wet brush or sponge until it is limp.

The next problem chosen because of its similarity to the

foregoing, is that of copying pictures under glass. It happens frequently that a picture is considered too valuable, or the time is not available, to remove it from the frame. If one can place the whole thing on the copy-board arranged under the conditions just laid down all will be well, providing that the area to be copied is not larger than the copy-board provides for. These fortunate circumstances, however, seldom fall to the lot of the photographer. The underlying principle is precisely the same, but the means to achieve the desired end differ, for the simple reason that while in the first case we were able to fix our lights conveniently, here we must take our lights pretty much as we find them. If there are windows on two adjacent sides of the room, with a dark corner between which the picture can face, then the conditions approximate very much to those laid down for a copying installation. It is rather rare, though, to find circumstances so favourable that it is possible to place the picture just as one wishes, and usually one has to be satisfied with a single source of light. Usually, however, this is sufficiently large to permit of its being split up into two by a fairly large black curtain, which is supported so that the camera is behind it and the lens peeps through a slit in the centre. This slit should be provided with a few dress-fasteners, so that it can be well closed round the lens. A peculiarly shaped dense spot on a negative may be traced to a part of such a slit being left open so that a little light crept through over the top of the camera. In fact, it has not been unknown that a bit of the red focussing cloth showing through such a curtain has been registered on a negative when (as always should be in picture copying) a panchromatic plate was used with a deep filter. People who do not trouble about such a thing as a black curtain are seldom troubled either with such markings, for the simple reason that their negatives have more or less haze from reflections all over them.

How a curtain for this purpose should be held up is a matter for individual circumstances, as well as for individual ingenuity, as it should in any case be rather larger than the subjects to be photographed, and considerably so if some distance is maintained between subject and camera. The writer has often been amused by seeing an illustration of such a curtain being held up in the manner of a banner by two men supporting a pole on either side with the avowed object of preventing reflections in a shop-window. Apart from the strictly commercial aspect of the case, that the price for a shop-window photograph seldom, if ever, permits of the transportation of two large poles and the time of three men, the technical point that makes the idea so futile is that a screen sufficiently large effectively to prevent reflection in any shop-window must be at least four times its area. Certainly, any attempt at using such a curtain would instil an element of sport into a very dull business. A window that is dressed with dark goods, and has buildings of a light nature opposite, is pretty much like a mirror, and reflections are practically unavoidable. As regards the goods, the proprietor often arranges a special display for photographing, and if a word can be got in beforehand it may be suggested that the contents should be kept as light in colour as possible, and also well forward towards the glass. If the latter has had the quite recent attentions of the window-cleaner a noticeable improvement in the quality of the photograph will be effected.

Even as regards the buildings opposite the shop-window the photographer is not entirely helpless. Sometimes a standpoint a little more to one side or other avoids certain details, but there is one very helpful thing the operator can do. That is to discover the time when the sun will not be actually shining on the shop in question, but when either it is nearly upon it, or has just left it. It must be obvious that if the strongest light shines on the opposite buildings the very finest set of reflections imaginable will most certainly result. The more one can get to having these details in shadow the better the photograph will be. A method of finding out the time of day required was described by me in the "B.J." and the "Almanac" a few years ago under the title of "Sunshine Index." The most unreliable means of discovering the required information is to ask the people in the shop. Strange, but true. When the training of observation is made a school subject, in place of mere accumulation of second-hand information, such a difficulty should no longer obtain.

I mentioned the case of the portrait artist who has a sitter wearing glasses. Many light studios give trouble in the form of haze over the lenses obscuring the eyes. Some operators make a practice of removing the glasses from the frames, but this plan has two objections to it. The first is that the sitter is apt to wear a strained expression when without the glasses to which he is accustomed. The second is that the detail of the eye is apt to look over-sharp. In a successful result taken normally, there is the natural expression, in addition to the eyes as one sees them through the glasses; it may be the least bit larger than life, and there is a tiny glint on the bevel edge of the lenses which shows that a glass is there. Unnoticeable details, perhaps, but the effect is quite distinct. Now except for extraordinarily curved lenses, the solution of the problem is simplicity itself. It is the same method as is used for glazed pictures. A focussing cloth hung over a head-screen or just held by an assistant in the direction the sitter is looking, wherever that may be, will be efficient prevention of all objectionable reflections. In any case one can observe the effect by looking over the camera just before exposure, so that there is no chance work about it.

When we turn to the question of polished articles the case is somewhat different. If we erect black curtains to cut off reflections the result most probably will be turned down with disgust. The black screens will show as black patches in the polished surfaces of the subject, and the larger the screens the blacker the article will look. Now polished articles should be represented as brilliantly as possible, and if it be glassware or silver they should look white, and not black. Hence in these things we actually need reflections, but not merely mirrored images of the room and its contents. Hence for this class of work it is desirable to employ quite a big area of diffusing material, as well as of reflecting surface. In fact, many who specialise in this work go so far as to construct miniature studios of diffusing material such as muslin, or even of tracing cloth, so as to get a continuous reflection, and so show the contours of the object to perfection. Such reflections as are the result of part of the subject showing in a polished surface of the same item, such as, for instance, the handle of a loving-cup, cannot be prevented, except by the expedient of airbrushing a coat of light grey paint all over. This method gives a very beautiful result, if done properly, but is quite a piece of work to do, and never gives the impression of polished silver as a natural photograph does. However, if the photograph is for the purpose of making a process-block, it is quite a good plan, and is certainly cheaper than making an "ordinary" photograph, on which the process-artist has to expend quite a lot of time and skill.

We must treat now of commercial subjects in which objectionable reflections are liable to occur. These are simply legion. Almost every article which one may be called upon to photograph has some reflecting, or semi-reflecting, surface. Take the parts of a typewriter, for instance. A polished bar reflects the details of a room just as the silver cup did, but instead of these being recognisably distorted, they are spread along the full length of the bar in lines of black and white. The process artist transforms these into a beautifully gradated round or square bar, as the case may be. Then we have the enamelled black base and case. Not only do the same remarks apply, but I have found many people quite astonished when I have shown them that a surprising amount of objectionable reflections in many polished articles, including furniture, arises not from the windows or other details that may be in front, but simply *from the white background behind* which is so very frequently demanded by clients. It is far better

to employ a medium tinted ground, and to block out the negative, than to photograph any polished subject of the kind against a white one, and rely on the very expensive labours of the process-artist to make a satisfactory result. It should prove a good business proposition to demonstrate to clients that a shilling or two more spent on a photograph can easily save several times the amount in process work. Block-makers naturally encourage the employment of their "art" departments, and so the worse the photographs supplied the more profit they make. Hence many manufacturing firms seem to regard photography as only a poor sort of basis for afterwork, so that the lower the price the better. It is surprising, too, how some of them resent the time and trouble which the operator takes to secure his results in the rather peculiar conditions often provided, till they see the improved results obtained. There seems to be room for a good deal of propaganda by photographers along these lines.

These latter remarks may seem to be going off the point. When analysed, however, the improvement in results will be found to consist mainly, if not wholly, in the handling of reflections, their avoidance or their modelling into shape. An article of this subject would not be complete without a reference to the virtues of "pan" plates and filters in curing reflections. The major portion of the light shown in the form of objectionable lights or haze on the surface of polished or half-shiny surfaces, including the very objectionable result often seen in negatives and copies from prints of the "satin" class consist of ultra-violet impressions. By "cutting-out" this light one succeeds in getting an image of the detail that lies underneath this shine, whether it be the gradations of a print, the grain of wood, or some delicate engraving on metal, which may have become swamped by the amount of reflected ultra-violet.

D. Charles.

WITH A PORTRAITIST IN THE STUDIO.

VI.—SPACING AND SIZING.

In this country the usual plates in use are half-plates, whole-plates, and larger sizes, and it is customary to make portraits which approximate to these sizes. In serving the public, we are thus enabled to use terms which convey definitely the proportions of our photographs without mentioning exact measurements. While no doubt it is difficult to break away altogether from the traditions of size and shape, one is often hard put to it to make a harmonious composition fall within the space demanded by a stock mount. I believe firmly, however, that the public will welcome unusual pictures which have sound reason behind them. Take a case which I had a few weeks back. I had to go to a military barracks, where I have done a lot of work, to take a group of over a hundred men. For that work whole-plate and 15 by 12 are my standards. Since the conclusion of the war I have never had a really large group requiring a "Cirkut" camera, and I tried to get this group to take bigger than whole-plate. But they were only "Tommies," and wanted "something like that" (indicating a military group of about a dozen men) at a small figure. Well, I took my group in the best accepted method of the old professionals. I built them up in five rows, and crowded them to get the biggest possible figures. Still, when the negative was developed, a picture 8 by 2 inches showed all the soldiers and the rest was courtyard and barrack wall. I hadn't bigger paper in stock than 15 by 12, but I had a brain-wave. I enlarged the group on to a six-on postcard strip, dry mounted it tastefully, and submitted it with the orthodox whole-plate. I made a quotation for six dozen copies; it was ordered right away, and will serve me as a standard for future groups of a similar nature. The small man who gets an occasional order like this will find this a good substitute for a "Cirkut" group.

With studio portraits, we have no great difficulties in this respect, and when we look at the great variety in design and colour of modern mounts for cabinets, it will be seen that we have travelled somewhat from my young days of the black or white g.b.e. mount, common to all photographers, and which was ordered in lots of 10,000.

Yet, when all is said about shaping each set of prints differently to suit the picture, we must realise that it is well-nigh impossible to run a big business, unless the great bulk of the work conforms to a standard size and shape.

There is nothing for it, then, but to plan out our pictures in terms of definite shapes. The man who uses postcard plates is generally cleverer at sizing and spacing than many in a better way of business, for the simple reason that there is no latitude, print and plate being the one size. For all-round work in the studio, busts, full lengths, and groups, the half-plate is of fine proportion. We all know the great difficulty in getting the public to take cabinets, when postcards are on offer. Now, it's no good fooling the public: you can't give them six postcards for 3s. 6d., and grumble if they won't pay 21s. for the same thing mounted on a large folder, and called a cabinet. I am not here discussing the question of postcards *versus* cabinets; I merely wish to point out that the photographer's own foolishness, and in many cases his meanness, has given the public the impression that the only difference between the two pictures is the mount. I will discuss sizing and spacing firstly from the standpoint of selling the goods, and then from the artistic side.

We all know that artistic value cannot be measured by inches or feet. Still, whether we like it or not, most of our work is bought and sold "by the yard," as the stickyback merchant puts it. I remember having just finished an exquisite tinted miniature of a pretty child, and I had it on view in the reception room, before sending it home. When my assistant told me she had three inquiries for the price of the coloured photos "per dozen," I withdrew the exhibit. Unfortunately, the artistic soul of the people is big—20 by 16, in fact. Now, when that is so, and the postcard is a serious menace to the man whose work is worth more than a few shillings per sitting, why do we see so much of the "small cabinet" work about? And again, when we habitually use half-plate size and mounts that accommodate 6 by 4 prints, why do we still do pictures, which would not suffer if trimmed down to postcard size? The answer is that of Dr. Johnson to the lady who asked why a certain word was not in his dictionary. "There is only ignorance to account for it," he said.

Many studio cameras have a focussing screen larger than the size of picture in everyday demand. We have something of the 20 by 16 mentality ourselves. Think of the huge cameras in galleries, where it is an event to expose a half-plate! Few of these focussing screens are lined off properly, and most of them look like a railway junction. I would lay down the rule that only as much of the focussing screen should be seen as will give the exact size of the finished print. The fact that a "cabinet" is considerably smaller than a half-plate is responsible for mistakes in sizing. "Get the picture well within the half-plate lines" is the usual formula, and the new girl printer is allowed to use *her* discretion as to where she places the paper. That doesn't strike me as a method to produce uniformity of output. Those photographers who have difficulty in getting cabinet orders should try a set of specimens taken full half-plate, and see how much more imposing they look than postcards. There is a very

great difference between a picture 6 by 4 and one 5 by 3, and if, consciously, the one is taken small and the other as large as possible, the difference will be all the more noticeable. I suggest that a cabinet picture should (particularly with groups) be taken so that it is impossible to get a postcard from it without copying down.

Don't run away with the idea that I want you to make extra large figures for cabinets; it is largely a case of spacing. Take the orthodox group of two, one sitting, one standing. To get that nicely into a postcard, three inches is all the width allowable to give a little for margin. Well, even with the same grouping, it is simple to widen out the picture, so that it needs four inches to cover the interest. I have frequently seen customers actually measuring an alleged cabinet with a postcard, but I have never yet come across one who could see where a picture taken as a cabinet might just as well have been squeezed into a postcard. The measurement test is the one to convince the public.

Economic considerations apart, the spacing of the picture between its four lines, the consideration of the size of the head in bust work, the use of vignetting as an adjunct to composition, are factors which must be taken into account by the artistic worker.

A full length is probably the simplest portrait to space. Everyone knows that the figure is centred, and slightly more head room is left than under the feet. Ordinarily, a full-length gives no index to the height of the subject, and if it is wanted to convey an impression of size, there are recognised ways of doing this. Keeping a low camera, and getting the head higher up the plate than usual, are two ways of giving a small person dignity. If I were taking a small man, all done up with his new robes of office, I would take good care to make the most of his "little brief authority." If furniture came into the composition, I would see that the pieces were of small size. A high-backed chair and a little man should not be photographed together. When we reflect that most of the world's great men have been of small stature, it is peculiar that, somehow or other, dignity and importance instinctively suggest tall, classical figures to our imagination. It may be the sub-conscious working of the 20 by 16 mind, but, whatever the cause; and despite its utter unreasonableness, no one likes to be thought small, unless it is an asset, like the figure of Little Tich. No very hard-and-fast rule can be laid down governing the placing of the figure between the two vertical outlines; so much depends on the position, and, after all, there is much of caprice or fashion to be considered. It is generally recognised that there should be more space in front of the head than at the back, to avoid the impression that the figure is walking out of the picture. While this is more or less of an axiom for any portrait, I submit that, for ordinary good everyday portraiture, nothing other than taste is required for the harmonious setting of a full length. So much, as I have said, depends on the position, the subject, and the general scheme of the picture that it is impossible to dogmatise. A lady bending over a bowl of roses, a child leading a toy horse or pushing a wheelbarrow, a dancer with outstretched limbs, are all problems in spacing which must just be settled as they come up. A splendid plan is to make a cut-out mount and experiment by placing over your favourite pictures, observing the effects of different settings. All these ideas of sizing and spacing should be worked out in practice, so that there is never any uncertainty with a sitter. A picture accurately placed on the focussing screen will give a negative that leaves no problem for the printer or the girl who trims for the mounting machine.

There is a craze at present for some rather freakish heads, due, no doubt, to the influence of cinema favourites, in their search for novelty—heads falling out of the picture, looking round corners, and other "jazz" styles. Fashion plays a much greater part in the success of photographic portraits than most of us think. I remember the sneers of a stodgy old professional when a rival advertised that he had just returned from Paris with all the latest styles, and was now showing *the very newest positions*. But the sneers did not alter the fact that the pushful one did postcards much smarter than his competitors (and always dearer, too), and made a fortune. Just as the theatre-going public are keen for a while on the "Bull Dog Drummond" class of drama, so are our clients for "the newest positions." I would say this as a word of caution to those who would cultivate jazz in portraiture, or novelty in placing the figure: always make your deviation from the usual palpable. A print just a trifle to one side, or a head slightly tilted, may suggest carelessness, but with a very decided departure it is impossible to be mistaken about the intention of the artist.

The almost general adoption of the use of vignetting in front of the lens has proved of great service in selection, and enables one to modify bust and three-quarter lengths very considerably. Hitherto, one had to take the figure big to cut out unpleasing parts, or vignette the print, and this was not suitable for dark backgrounds. Now, however, it is a simple matter to take the figure as small as may be wished, getting rid of the useless bits by the judicious use of a vignetting card which harmonises with the general tone of the picture. In skilful hands—and there is very little to master—the vignetter is a tremendous help with difficult sitters. With an ordinary type of picture, a bust looking to the front, a simple three-quarter length or small group, it is merely the corners which require to be vignetted, but a word or two about very definite changes which may be brought about by the application of a little method may be welcome. I draw your attention to three little sketches representing different aspects of similar objects.

Fig. 1. Fig. 2. Fig. 3.

In the first illustration (fig. 1) the "building" may stand itself, but, if requiring assistance, the supports would be placed as shown. In the other sketches (figs. 2 and 3), the object is falling, and there can be no question of placing the support. I have indicated by dotted lines how to vignette pictures where the positions bear some analogy to my illustrations. Modify my ideas as you will, get hold of the guiding principle, and you will always be working in the right way; always give more support by leaving more of the figure on that side where the weight predominates.

In the first picture (fig. 1) the head would be centred, and if vignetted, both sides would be treated alike. In the case of a profile (as in fig. 2) there should be more space in front of the head, and vignetting mostly at the back of the figure. For the three-quarter pose (fig. 3) the head may be exactly in the centre, as showing more space in front of the eyes, *never the other way about;* vignetting may be as in fig. 1, or take off more on the opposite side to the support.

Much of our work in the studio seems to be taken up with efforts to make thin people look well developed, fat sitters look normal, and to give the appearance of height to those lacking in inches. It has been well said that "the normal is quite abnormal," and our daily studio experience bears that out. But, the greater deviation from the "normal," the more earnest seems the desire to approximate to the average. The vignetter is a great adjunct to the flatterer. Take a short stout woman. She wishes to be taken three-quarter length standing. We must not take her "too near the camera," so we have to focus the figure on the small side, which, before vignetting, will look like a big full length. Well, then, just vignette her skirt *as near the ground as possible,* and, although you know that the skirt finishes exactly

where the indefiniteness begins, the eye takes the impression that there is much more of the subject cut away. If the spacing is good, the figure rather high on the plate, the arms and lines kept in a downward direction, the portrait should be successful. In a bust of the same subject, if the body is turned away from the camera, the near arm and shoulder can be treated very drastically, reducing the bust to a pear-like shape. If the student will take some little trouble over these problems, experimenting along the lines I have suggested, exposing an odd plate or two on the same subject treated differently only in the matters of spacing, sizing, and vignetting, making and filing prints of good and bad examples, he will find his work considerably enhanced, and, in studying the portrait work of masters, he will be enabled to see how many effects are produced which formerly were beyond his comprehension.

J. EFFEL.

THEORY AND PRACTICE OF DEPTH OF FOCUS.

III.

[Following the formulæ and practical significance of hyperfocal distance, which were the subject of the second of the present series of chapters, the present paper shows the derivation and application of the formulæ for the nearest and furthest distances from the lens to which depth extends when focussing sharply upon a given distance with a lens of given focal length and diameter of stop. It is also shown that, in accordance with the view that the admissible disc of confusion should be a small constant fraction of the distance from which a print or enlargement is viewed, these distances of nearest and furthest focus are independent of the focal length of the lens. In Chapter IV. we shall come to the formula for ascertaining the distance on which to focus in order that depth may extend to given distances further from and nearer to the lens; also the formula for the stop which is required under these conditions if the permissible unsharpness is to conform to a chosen standard. From the standpoint that the admissible disc of confusion may vary in proportion to the distance from which the photograph is viewed, these formulæ become much simpler. Chapter IV. will also explain the basis of a series of distances on which to focus such that, when focussing on any one of them, far depth extends to the next larger and near depth to the next smaller, that is to say, the distances which are the basis of depth focussing scales.]

Near and Far Distances to which depth extends when focussing on a given distance.

In fig. 7 an object at distance u is focussed so that its image is formed at P at a distance v from the diaphragm.

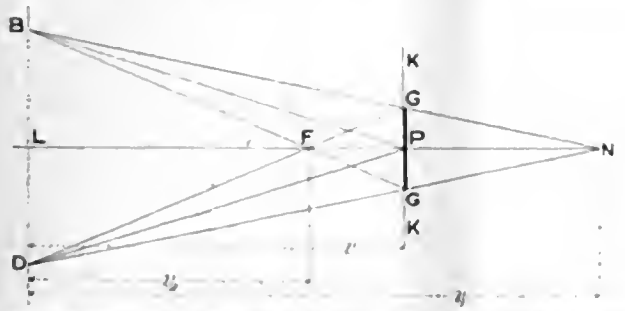


Fig. 7.—Illustrating images F and N of furthest and nearest objects to which depth extends when focussing on a given object.
P is the point of the object in sharp focus. F is the image of the further object and N of the nearer, the cross-section of pencils from each being $G\,G = c$ in the plane of the focussing screen $K\,K$.

If now an object is at such a *nearer* distance u_1 that the pencil of rays, coming to a focus at N, has a cross-section in the focussing screen equal to $G\,G$, the maximum circle of confusion, u_1 is then the nearest distance to which depth extends.

Similarly, if an object is at such a *further* distance u_2 from the camera that the pencil of rays, coming to a focus in F diverges to the diameter $G\,G$ in the focussing screen, u_2 is plainly the furthest distance to which depth extends.

In the diagram, N and F are thus the foci of objects at these nearest and furthest distances and v_1 and v_2 are the distances of these foci from the diaphragm. This construction in the image space enables us to obtain the formulæ for the near and far distances u_1 and u_2.

As before we denote the diameter $G\,G$ of the circle of confusion by c: the diameter of the stop by d and the focal length of the lens by f.

Near Distance.

In the similar triangles, $B\,N\,D$ and $G\,N\,G$,

$$\frac{L\,N}{P\,N} = \frac{d}{c}$$

But $P\,N = L\,N - L\,P = v_1 - v$.

Therefore $$\frac{v_1}{v_1 - v} = \frac{d}{c}$$

or $$v_1 = \frac{dv}{d-c} \qquad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (a)$$

Now the image distances v and v_1 according to the law of conjugate foci, may be expressed in terms of the respective object distances and focal length of the lens, that is:—

$$v = \frac{fu}{u-f} \text{ and } v_1 = \frac{fu_1}{u_1 - f}$$

If these values of v and v_1 are substituted in equation (a) we get:—

$$\frac{fu_1}{u_1 - f} = \frac{fdu}{(u-f)(d-c)}$$

Whence $$u_1 = \frac{fdu}{fd + c(u-f)} \qquad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (7)$$

This rather complicated formula for the nearest distance to which depth extends may be put in a simpler form by first dividing numerator and denominator by c, when it becomes:

$$u_1 = \frac{\frac{fd}{c} \times u}{\frac{fd}{c} + u - f}$$

As we have already seen from formula (4), $\frac{fd}{c}$ is the formula for the hyperfocal distance. Using the symbol H for it, the formula for the nearest distance to which depth extends, when focussing on an object at a distance u, becomes:

$$u_1 = \frac{Hu}{H + u - f} \qquad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (8)$$

In words, *the nearest distance rendered without perceptible unsharpness when focussing sharply on an object at a distance* u *is equal to the hyperfocal distance (for the particular focal length and lens aperture) multiplied by the distance* u *and divided by the sum of the hyperfocal distance and the distance* u *less one focal length.* All quantities expressed in the same unit, ft., inches or centimetres.

For example, when focussing on an object 10 ft. distant with a 6-in. lens at $f/16$, what is the nearest distance in "focus," if 1-100th of an inch be taken as the standard of permissible unsharpness? Here the hyperfocal distance, given by formula (4b), is:

$$\frac{100 \times 6 \times 6}{16} = \frac{3,600}{16} = 225 \text{ ins.}$$

The required distance is therefore $\frac{225 \times 10 \times 12}{225 + 120 - 6} = 80$ ins. $= 6$ ft. 8 in.

Formula (8) can be further simplified by omitting the f in the denominator. If the value of the hyperfocal distance or the distance u of the object is great relatively to the focal length of lens, the effect of this latter is negligible in formula (8), which then becomes:

$$u_1 = \frac{H \times u}{H + u} \qquad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (8a)$$

Practically the more exact formula (8) is necessary only when the object is very near to the lens, e.g., a few multiples of the focal length

away from it, and when also the hyperfocal distance is small in consequence of the shortness of the focal length of the lens or use of a small stop.

Far Distance.

The formula for the farthest distance rendered without permissible unsharpness when focussing sharply on an object at a distance u is derived in like manner from the construction of fig. 7.

In the similar triangles $B\,F\,D$ and $G\,F\,G$,

$$\frac{L\,F}{F\,P} = \frac{d}{c}$$

But $F\,P = L\,P - L\,F = v - v_2$

$$\text{Therefore } \frac{v_2}{v - v_2} = \frac{d}{c}$$

$$\text{or } v_2 = \frac{dv}{d + c} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (b)$$

Substituting as before the values of v and v_2 in terms of f and the respective object distances u and u_2 into equation (b), we get:

$$\frac{f\,u_2}{u_2 - f} = \frac{fdu}{(u - f)\,(d + c)}$$

$$\text{Whence } u_2 = \frac{fdu}{fd - c\,(u - f)} \quad . \quad . \quad . \quad . \quad . \quad . \quad (9)$$

Again we divide numerator and denominator by c and obtain:

$$u_2 = \frac{\frac{fd}{c} \times u}{\frac{fd}{c} - u + f}$$

Replacing $\frac{fd}{c}$ (hyperfocal distance) by the aymbol H, the formula becomes:

$$u_2 = \frac{H \times u}{H - u + f} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (10)$$

In words, *the farthest distance rendered without perceptible unsharpness when focussing sharply on an object at distance* u *is equal to the hyperfocal distance (for the particular focal length and lens aperture) multiplied by the distance* u *and divided by the difference between the hyperfocal distance and the distance* u *plus one focal length.*

For example, in the circumstances chosen for the illustration of formula (8) for near distance, the far distance to which depth extends when focussing on 10 ft. is:

$$\frac{225 \times 10 \times 12}{225 - 120 + 6} = 243 \text{ in.} = \text{say } 20 \text{ ft.}$$

As in the case of formula (8), formula (10) is further simplified by neglecting the odd focal length in the denominator and then becomes:

$$u_2 = \frac{H \times u}{H - u} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (10a)$$

Formulæ ($8a$) and ($10a$) are quite accurate enough for almost all conditions which occur in practice, and are the formulæ to be used except when photographing on a scale which approximates to same-size reproduction.

Near and Far Depth Distances in Terms of Variable Disc of Confusion.

If, in accordance with the idea that the disc of confusion should be a certain small fraction of the distance at which the photograph is viewed, we adopt, say, 1-2,000th (= .0005) of the viewing distance as the value of c, the foregoing formulæ become much simpler.

If the distance of the object in sharp focus is u, the camera extension (i.e., viewing distance) is:

$$\frac{fu}{u - f}$$

Adopting 1-2,000th of this distance in place of c in formula (7), the near distance u_1 to which depth extends is:

$$u_1 = \frac{fdu}{fd + \frac{1}{2{,}000}\,\frac{fu}{u - f}\,(u - f)} = \frac{fdu}{fd + \frac{fu}{2{,}000}} = \frac{2{,}000\,du}{2{,}000\,d + u} \quad (11)$$

In words, *when focussing on an object at a distance* u *with diaphragm of diameter* d, *and adopting an angle of sharpness of vision of* 1-2,000th, *the distance of nearest object in "focus" is* 2,000 *times the diameter of the diaphragm multiplied by the distance of the object divided by* 2,000 *times the diameter of the diaphragm plus the distance of the object*

Remembering that from the standpoint of variable diameter of the disc of confusion, the hyperfocal distance is 2,000 d, it will be seen that the above corresponds with formula (8a), viz., near depth distance is:

$$\frac{H \times u}{H + u}$$

While formula (11) shows that on the basis of sharpness of vision, depth is independent of the focal length of the lens, this formula may be written in terms of the relative working aperture ($F.\,N°$) by substituting $\frac{f}{F.\,N°}$ for d.

Formula (11) then becomes:

$$u_1 = \frac{fu}{f + .0005u \times F.\,N°.} \quad . \quad . \quad . \quad . \quad . \quad (12)$$

In a similar manner the far distance u_2 to which depth extends (adopting a disc of confusion of 1-2,000th of the viewing distance) may be written as:

$$u_2 = \frac{2{,}000\,du}{2{,}000\,d - u} \quad (13) \qquad \text{or } u_2 = \frac{fu}{f - .0005u \times F.\,N°} \quad (14)$$

Here again, putting H for 2,000 d in formula (13) it is seen to correspond with formula ($10a$), viz., far depth distance is:

$$\frac{H \times u}{H - u}$$

When used in connection with the variable disc of confusion the two approximate formulæ ($8a$) and ($10a$) therefore becomes precise.

In the next article we will see how to find u, the distance on which to focus in order to obtain an equal degree of admissible unsharpness at the nearer distance u_1 and the farther distance u_2. G. E. B.

(To be continued.)

MAKING INCREASED CAMERA SALES IN THE AUTUMN.

THERE is a great burst of activity in selling cameras and accessories in the spring and summer, but during the autumn and winter it seems to dwindle down to almost nothing. This is a mistake, because in the autumn there are such events as shooting, tramping, football, and Christmas, all of which are excellent sales opportunities if sufficiently exploited.

Some of the camera displays from America arranged last autumn may suggest ideas for your own efforts along these lines.

John W. Hilton, Richmond, Va., U.S.A., appealed to the autumn hunter with an appropriate camera display. Autumn leaves, mainly oak, chestnut and sycamore, covered the window floor, with several saplings planted here and there. Along the rear the effect of a fence was obtained by planting saplings in close formation. Such articles as guns, golf sticks, game bags, and Kodaks were hung on the branches of the little trees. More cameras were scattered about the floor, backed up by the following sign:—

"Hunting With a Kodak."

Another Kodak display with the shooting appeal was made by the Owl Drug Co., Battle Creek, Mich. Sky-blue crêpe paper covered the background, which was banked with reeds, rushes, and autumn foliage. A rowboat was just emerging from the underbrush, with a large-sized camera placed in the prow of the boat. "Kodak as you go" was the message a card conveyed.

The Rouser Drug Co., Lansing, Mich., gave the Kodapod an autumn setting. Autumn leaves covered the floor, while cornstalks and sunflowers were banked around the sides and rear. There

was a low rail fence across the rear, a Kodapod being attached to the top rail. A near-by card suggested:—

"Use a Kodapod—Fastens Anywhere."

The Oseen Photo. Supply Co., Denver, Colo., employed dolls to excellent advantage in an autumn camera setting. A camera rested on a small tripod near the centre. Beside the camera was a large doll. She was posed in the act of manipulating the camera, her subject being a smaller doll, posing in front of a sheaf of wheat, with two large pumpkins placed on either side of it. At each far corner of the window was a similar sheaf of wheat, with pumpkins resting at the base of the same.

Kodak, Ltd., Regent Street, London, England, floored an autumn camera display with brown sateen cloth, over which different types of Kodaks were distributed. A large sign at the rear was captioned in the following convincing vein:—

"AUTUMN PHOTOGRAPHY—

"Kodak Photography can be practised at this as well as any other season of the year.

"Take a Kodak on your country walks and bring home photos. of the beautiful autumn effects, obtainable at no other season of the year."

The script of the card was in orange against a brown surface. Another card suggested:—

"KODAK PHOTOGRAPHY—

"You load in daylight.

"You develop in daylight.

"You print in daylight."

"It is daylight all the way" was an oval-shaped card of a grained brown, over which brown, green, and yellow ribbon streamers were hung.

B. M. Levoy, Inc., New York City, injected the Christmas atmosphere in their window display. They accomplished this by enveloping the background of their small show window with midnight-blue crêpe paper, against which was propped a scarecrow, stuffed with straw, and wearing an old coat and a pair of trousers. Grotesque features were painted on his head. Two cards, one held in each hand, bore the following message:—

"With the folks turning homeward for the gathering of the Clans
There's a golden chance to Kodak, says the Scarecrow Man."

"With the turkey on the platter and a Kodak in the hand,
There's a real Christmas for you, says the Scarecrow Man."

Turkey cut-outs were placed among the Kodaks exhibited on the floor. Framed photographs of pumpkin scenes reposed on the floor at the rear.

The Shaw Supply Co., Tacoma, Wash., put in a clever and effective window display with the idea of showing how the Christmas dinner party could be photographed. Usually the light is poor, so artificial light is resorted to, with the result that a flashlight photograph is possible. The display contained a real dining-room table, with places set for six. Instead of the usual table furnishings, photographic accessories were substituted. Beside each diner's place was a tripod, about as tall as the table, with a camera resting upon it. Large Kodak pictures, cut round-shape, performed the duty of plates. The cocktail was substituted by an Eastman flashlight powder, with rolls of film serving as water glasses. Eversharp pencils and fountain pens were used instead of the conventional cutlery. A huge platter occupied the pride of place at the table, with a large enveloping box replacing the turkey, surrounded by small boxes of film, developing powders, pencils, and a measuring glass, for the fixings. The entire display was backed up by a large sign at the rear, which proclaimed:—

"When the table is set and the guests are gathered about it, take a Flashlight Picture with your Kodak. We will give you expert information on how to take the picture."

The Christmas atmosphere in a camera display by Koenig's, Newark, N.J., was carried out by suspending a holly wreath halfway down the ceiling at each side. A card fitted inside each wreath read:—

"Brownie Cameras for Christmas."

Brownies were set on top of their cardboard boxes about the green crêpe window-floor, with a border of rose crêpe paper.

A well-expressed announcement, occupying no more than two inches, single column, in the rotagravure section of one of the Boston dailies, was that of the Robey-French Co., Boston, Mass. Here is the piece of copy in question:—

"A Snowy Scene,
A Kodak,
A well-developed film,
A perfect print,
Nature supplies the first,
The rest,
Robey-French Co.,
30, Bromfield Street."

Also use it as a window card; it is concise enough for this purpose.

E. A. Dench.

SILVERING MIRRORS.

The following note is reprinted from a recent issue of "Popular Astronomy," sent us by Mr. Edward S. King, who writes as follows:—The method described below is a modification of Lundin's process as developed in experiments made by my son, Everett, who died in 1917. These experiments were made by him during the summer of 1912. He found that the original formula contained an excess of formaldehyde, so that if the silver nitrate was doubled, a much thicker coat could be obtained. As he remarked, a thick coat of silver stands burnishing better and lasts longer. The chief point he discovered was in regard to the temperature. He found from his experiments, which were carefully recorded with all particulars, that the absolute temperature, within reasonable limits, did not make much difference; but if the mirror was about 10 deg. to 20 deg. Fahr. warmer than the silvering solution, a thicker coat resulted and the process was more reliable. Some have thought that the stannous chloride used in the Lundin process acts on the surface of the mirror. If it is washed off thoroughly enough to prevent chloride stains on the silver deposit, it seems that no other effect can be possible.

The burnishing of the mirror is of utmost importance. He found by experiment that the average reflectivity of four unburnished mirrors tested was photographically about 58 per cent., against an average of 78 per cent. when burnished. The mean of 13 tests gave a reflectivity of 83 per cent. after burnishing. The best coat obtained reflected 90 per cent. of the photographic light. The directions, which follow, were prepared by him and are now in use in Harvard observatory. For silvering a 24-inch mirror it requires about two litres of solution or 20 times the formula.

Directions for Silvering Mirrors.— First a saturated solution of stannous chloride is made up, and diluted for use with an equal volume of water. Several wads of clean absorbent cotton are laid out on a clean sheet of paper. The surface of the mirror is carefully rubbed with one of the wads dipped in nitric acid. This removes the old coat of silver, with all the dirt which may be adhering.

After thoroughly washing off the nitric acid, a fresh wad of cotton wet with the stannous chloride solution is rubbed over every part of the surface of the mirror. Water is then poured over the mirror, and the surface is rubbed, first with the same wad, and then with a fresh one. Great care should be taken to remove all traces of the stannous chloride, as, if any is left on, it makes the coat granular. One should be careful not to touch the surface with the fingers, as any trace of grease is fatal.

The mirror, if a small one, may then be placed in a tray just a little larger than itself, and covered with water, at temperature from 65 deg. to 70 deg. Fahr. If a large mirror, a band of waxed paper, tied tightly around the edge, makes a dam and serves the same purpose.

Two solutions are required as follows:—

A.	Water	100 cc.
	Silver nitrate	4.3 gm.
	Add strong ammonia just sufficient to dissolve the precipitate first formed.	
B.	Water	20 cc.
	Formaldehyde (Merck)	4 cc.

The temperature of these solutions should be about 45 deg. and 50 deg. F.

The wash water is then poured off the mirror, the solutions quickly mixed and poured over the mirror. Silver will begin to be formed on the surface of the glass almost at once, the solution turning to a red-brown colour. In about half a minute, the solution

begins to turn muddy, with a granular black precipitate. The mirror should be left in it until this precipitate begins to stick to its surface. This usually requires from three to five minutes. The mirror is then washed with wet cotton and flowing water, and set on edge to dry.

It is important to get as thick a coat as possible, for such a coat stands burnishing better and lasts longer. The thickness can be roughly estimated by observing the amount of light transmitted by it. An electric-light filament can barely be seen through a thick coat.

The burnishing is done with a pad of chamois skin, into which some very fine rouge is worked. The best rouge is that washed out from the cloths used after the final polishing in the making of a large lens. The rouge is only sufficient to colour the pad. The surface of the pad must be kept perfectly free from dust, or the delicate surface of the silver will be scratched.—(Signed) Everett T. King, Harvard College.

FORTHCOMING EXHIBITIONS.

August 26 to September 9.—Toronto Camera Club. Secretary, J. H. Mackay, Toronto Camera Club, 2, Gould Street, Toronto, Canada.

September 9 to October 7.—London Salon of Photography. Latest date for entries, August 30. Particulars from the Hon. Secretary, London Salon of Photography, 5a, Pall Mall East, London, S.W.1.

September 11 to 15.—Professional Photographers' Association, Prince's Galleries, Piccadilly, London, W. (Trade and Professional). Hon. Secretary, Richard N. Speaight, 157, New Bond Street, London, W.1. Also foreign invitation loan exhibition of professional portraiture. Hon. Secretary, Marcus Adams, 43, Dover Street, London, W.1. Latest day for entries and exhibits, August 31.

September 18 to October 28.—Royal Photographic Society Annual Exhibition. Latest date for entries, August 25 (carrier); August 26 (hand). Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

October 18 to 21.—Rotherham Photographic Society. Latest date for entries October 4. Hon. Secretary, S. G. Liversidge, Orissa, Gerard Road, Rotherham.

October 18 to 28.—Portsmouth Camera Club. Latest dates: Entry forms, October 11; exhibits, October 16. Particulars from the Hon. Secretary, C. C. Davies, 25, Stubbington Avenue, North End, Portsmouth.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, August 8 to 12:—

ENLARGING.—No. 21,587. Artificial light photographic enlarging apparatus. A. C. W. Addis.

COMPOSITE PHOTOGRAPHS.—No. 21,829. Production of composite photographs. T. Brooks.

CAMERA ATTACHMENT.—No. 21,674. Attachment for cameras. F. L. and T. Dodman.

PRINTING FRAMES.—No. 21,521. Photographic printing frames. W. G. Hubbard.

CINEMATOGRAPHY.—No. 21,522. Cinematographic apparatus. S. H. Crocker.

CINEMATOGRAPHY.—No. 21,535. Cinematograph camera traversing and tilting apparatus. E. G. Marklew.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

CORRECTION OF OBLIQUE AERIAL NEGATIVES.—No. 180,360. (December 18, 1920). The invention consists in a method of transforming oblique photographs in which the negative is progressively exposed and transmitted to a sensitive receiving surface through a narrow slit fixed at right angles to the optical axis of the lens.

As in photographing from aeroplanes, exposure is nearly always made when the plane is inclined to the ground, pictures are obtained which appear oblique as compared with photographs taken when the camera is in a plane parallel with the object photographed. Hence the negative obtained from a camera on an aeroplane is an oblique negative, and to explain the invention, in the description here following, the treatment of such a negative is referred to.

In figs. 1 to 7 of the drawings it will be seen that the plane of exposure, 1, of the photographic camera, stands perpendicularly towards the optical axis 2, and the latter has an inclination α° towards the ground, indicated at 3A (fig. 1). According to the invention the process of transformation must be adjusted corresponding to the condition at the moment of exposure. For example, if the negative plate 1 taken from the aeroplane, or a copy obtained from the same, is placed perpendicularly towards the optical axis 2, the picture must be projected on a sensitive surface indicated at 3, which is either (as shown in fig. 2) adjusted to an angle with the optical axis equal to the angle α° formed between the optical axis and the ground at the moment of exposure, or (as shown in fig. 3) is at right angles to the optical axis, in which case the lens must be moved to correct perspective and the surface 3 moved to keep it in focus with the lens.

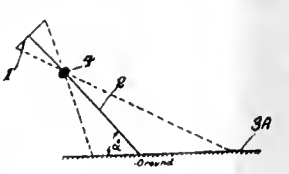


Fig. 1.

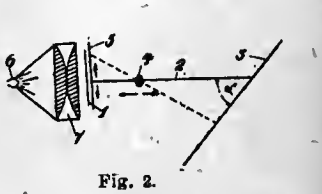


Fig. 2.

As the objective 4 only projects a sharp picture of a surface standing perpendicular towards the axis on to a receiving plate, also perpendicular towards the optical axis, there is only, at the shown position of object and picture, quite a narrow strip of the picture having a sharp reproduction, i.e., in the line of intersection between the sensitive surface and a plane perpendicular to the optical axis at the intersection of the latter with the sensitive surface.

To obtain, however, a sharp picture all over the surface of the receiving plate the negative is projected through a narrow slit, formed in a suitable member, indicated at 5, in the several drawings, moving over the negative, whilst the objective 4 and the receiving plane 3 are adjusted in such a way as to enable

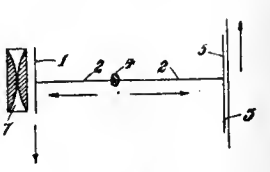


Fig. 3.

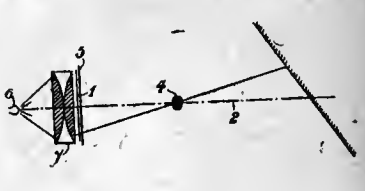


Fig. 5.

the latter to receive in a clear and defined manner the strip of the picture formed by the moving slit 5. The source of light 6 necessary to obtain the projection of the negative is disposed behind the plate, between which and the light is placed the usual condensing lens, as indicated at 7.

By adopting this stripwise formation the whole negative is gradually and correctly transformed and a sharp picture obtained. The objective is therefore moved correspondingly to the progressive projection for each moment of the whole process of transforming the oblique view into one as seen horizontally.

It is of great importance for the perfect transformation of the pictures that the negative, or picture, the slit, the objective, and the sensitive receiving plate have the correct proportion of motion one towards the other.

The slit bearer 5 may be placed before the sensitive surface 3 (fig. 3), or may be placed before the picture to be transformed (figs. 2, 4 and 5), or before the objective; it must, however, in any case remain permanently in a plane perpendicular to the optical axis 2 of the objective lens 4.

As the slit is preferably held in this position it is necessary that the picture to be transformed as well as the sensitive surface must receive a transverse motion one opposed to the other, perpendicularly to, and at the angle α^0, respectively to the optical axis, so that the whole picture to be transformed is projected through the slit. Alternatively, of course, the receiving surface might be held against transverse motion while the slit member is moved across the receiving surface.

The variations of scale for enlarging and the corresponding adjustment for sharpness of the picture require that the distances between the objective 4 and the sensitive surface 3 (fig. 3) on the one side of the objective 4 and the picture or

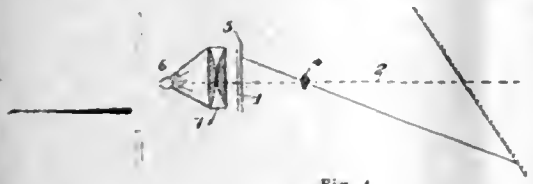


Fig. 4.

negative 1 on the other side are variable. For this purpose several arrangements are possible; either the negative plate 1 is stationary in the direction of the optical axis and the objective 4 and the receiving surface 3 are movable along it, or the objective 4 is stationary in the optical axis, while the receiving surface 3 and the plate 1, together with the associated condenser 7 and illuminant 6, are movable in the direction of the optical axis. Also the receiving frame 3 may be stationary in the direction of the optical axis and the objective 4 and plate 1, together with its associated condenser 7 and illuminant 6, may move in it. These motions in the direction of the optical axis must be continuous and progressive and must be positively connected with the above described transverse motions of receiving surface and picture.

In figs. 6 and 7 the negative 1 is illustrated as comprising a network with a diminishing appearance, that part of the negative nearest the subject photographed being indicated by the numerals 8 and 9, while the distance is indicated by the numerals 12 and 13. As shown in fig. 6, the negative 1 and the receiving surface 3 are parallel, and it is supposed that the near edge 8, 9 is being transferred to the receiving surface 3 through the slit 5. Through this slit 5 a thin area of the plate is transformed correspondingly, on a selected scale, within the optical limits prescribed by the lens used; the negative plate 1 is then moved in the direction of the arrow 10 (fig. 6) so that the next narrow parallel strip of the plate appears in the slit and is thrown on the receiving surface 3, which meanwhile is moved in the direction shown by the arrow 11, which movement is opposite to the movement of the negative plate 1 indicated by the arrow 10. This successive projected parallel strip would normally appear, however, on the receiving surface, on account of the diminishing appearance seen in the plate 1 (figs. 6 and 7) at a different enlargement to the preceding slip. To bring it

Fig. 6.

Fig. 7.

on the same scale as the latter the objective is moved in a direction along the optical axis 2 towards the plate 1, and the receiving frame 3 in the direction along the optical axis away from the plate 1. To adjust the second parallel strip two main motions have therefore been necessary:

(1) A motion of the plate 1 and of the receiving frame 3 in the respective directions indicated by arrows 10 and 11 transverse to the optical axis (transverse motion).

(2) A motion of the objective 4 in the direction of the optical axis 2 towards the condenser 7, and of the receiving frame 3 along the optical axis 2 away from the condenser 7 (axial motion).

For each following parallel strip of the plate new adjustments in the direction of these two movements would be necessary.

In figs. 8, 9, 10 and 11 a simple mechanical arrangement is diagrammatically shown for obtaining the required movements of the lens and receiving surface and negative.

In these figures the negative is indicated by the numeral 1, and the casing, indicated by the numeral 4a, contains the lens

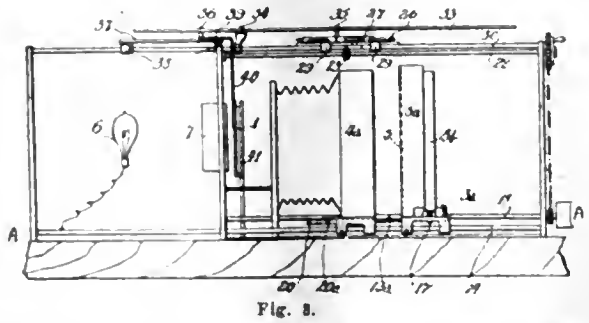


Fig. 8.

4, while the numeral 3a indicates a sliding carriage on which a casing 3b is mounted for transverse movement, the casing 3b containing the receiving surface 3, while in front of the casing 3b, and fixed to the carriage 3a, is a further compartment 5a for the slit bearer 5.

In the arrangement illustrated it is supposed that the lens box 4a and the sliding carriage 3a are slidable along runners or guides 14, which form part of a fixed framework of the apparatus.

The parts 1, 4a and 5a will be distanced apart according to the known laws for correct projection. In order to carry out the photographic process according to the invention the plate 1 and the receiving surface 3 will be moved at right angles to the optical axis and in opposite directions.

Referring particularly to figs. 8 and 10, the receiving surface 3 is carried across the carriage 3a by means of a pinion 15, a chain 16, and a pinion 17 fixed to the carriage, the pinion 15 being slidably mounted on a shaft 18, which is operated from a motor through a gear box indicated at 19. Any suitable arrangement may be used for connecting the receiving surface to the moving chain.

As the aeroplane plate is inclined when it is exposed, it will be necessary to continuously correct the position of the lens with regard to the receiving surface as the latter is moved over its carriage in order to correct the perspective. In order to obtain this adjustment of the lens during the process of transformation a bell crank pivoted at 19 (fig. 10) is fixed at a suitable position beneath the lens box; each arm of the lever is slotted, the longer arm 19a passing under the carriage 3a so that a finger (not shown), depending from the casing 3b, engages in its slot. Then as the surface 3 is moved across the apparatus the bell crank is tilted about its pivot. The shorter arm 19b is utilised to move the lens according to the known

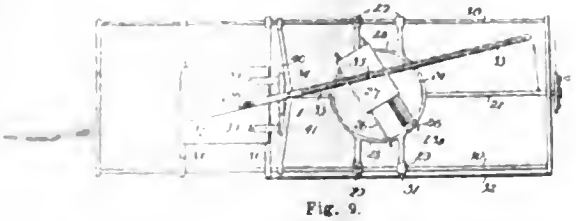


Fig. 9.

laws of perspective. To this end the lens box 4a is provided with a rod 20 having a depending finger 21 fitting into the slot of the arm 19b, so that the angular movement of the latter arm is converted into an axial movement of the lens, the arm 19b being preferably associated with a scale 19c, and the rod 20 mounted on a threaded member 20a so that the position of the rod 20 along the arm 19b can be varied according to the angle α^0 of inclination of the negative to its subject during exposure, that is, the smaller the angle α^0 the nearer will the rod 20 be to the arm 19a of the bell crank.

As the lens has been moved with regard to the receiving surface it becomes necessary to enforce a movement of the latter

proportionally to the movement of the lens in order to keep the receiving surface in focus with the lens. To this end a bell crank (figs. 10 and 11) is pivoted at a point 42 to the lens casing; the two arms 43 and 44 of the bell crank being slotted for the reception of bowls or pins 45, 47, fixed to arms 46, 48, carried by the negative holder 41 and receiving surface carriage 3a respectively. The distance of the pivotal point 42 from the lens is equivalent to the geometrical mean proportional of the distances separating the pins 45 and 47 from the lens, when they are in correct focal position therewith; with such a construction the receiving surface is compulsorily moved along the optical axis to keep it in focus as the lens is compulsorily moved along its axis, as described above.

In fig. 11 the distance of the pivotal axis 42 from the lens is indicated by the reference letter x, and it will be seen that

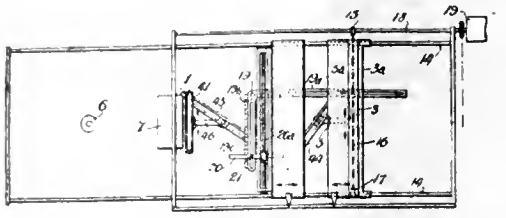


Fig. 10.

the arms 46, 48 are given the same length, and, further, that the angle between the arms 43 and 44 of the bell crank is a right angle.

During the movement of the surface 3 it is required to move the aeroplane negative 1 in proper relation for correct transformation of its subject. The construction enabling this to be carried out is best understood by reference to fig. 9, the arrangement shown in fig. 9 being superimposed at a suitable height above the arrangement shown in fig. 10 to allow the interposition of the camera and casings 5a and 3b as shown in fig. 8. The shaft 22 (figs. 8 and 9) is coupled to the shaft 18 (figs. 8 and 10) preferably by means of a chain drive indicated by dotted lines, so that a simultaneous rotation is obtained, this shaft 22 being connected through bevel gearing indicated conventionally at 23 to a rack 23a secured to a member 27 slidable on guides 26 on a turntable 24. The element of the bevel gearing fixed to the shaft 22 is mounted thereon so that the bevel can be slidden along the shaft, while rotation with the shaft is assured. The reason for this construction is that the turntable 24 is mounted in a frame 28 carrying bearings 29, which permit the table to be supported on the longitudinals 30 of the framework.

According to the angle of inclination $\alpha°$ the table is moved along the guides until a pointer 31 on one of the bearings 29 registers with a graduation on a rod 32 equivalent to the angle of inclination, and the turntable 24, which is graduated, is also appropriately set in accordance with the value of the angle $\alpha°$.

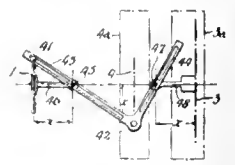


Fig. 11.

The rod 32 and the pointer 31 are not included in fig. 8 for sake of clearness. The framework also carries a proportional lever 33, pivoted at 34 and slotted in its longer arm to overlie the pin 35 on the slide 27. The short arm of the lever engages over a pin 36 on a platform 37 slidable transversely atong guides 38 carried on the framework. On the sliding member 37 are brackets 39 carrying depending members 40, which are connected to a suitable cradle 41 adapted to receive the negative 1, which is therefore in fixed relation to the illuminant as regards its position along the optical axis, the position of the illuminant being indicated at 6 in figs. 8 and 10.

With these two constructions the progressive movement of the negative 1 is assured, and the movement is regulated by the movement of the receiving surface 3. As the receiving surface 3 is traversed across the apparatus from the mechanism operated by the shaft 18, the shaft 22 is rotated and, operating the rack 23 on the turntable, causes the sliding member to move along the guides 26, and the pin 35 on the alide pushes the proportional lever so as to tilt it about its pivot 34, resulting, through the connection 36 with the platform 37, in a proportional movement of the cradle 41 carrying the negative 1. —Carl Janzer, Junr., 37, Hohenheimer Strasse, Stuttgart.

The following complete specifications are open to public inspection before acceptance:—

Apparatus.—No. 184,189. Method of and apparatus for obtaining photographs from moving objects, such as aeroplanes, airships, ships, motor-cars, trains, and any other vehicles. H. L. Cooke.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Monday, August 28.

Southampton C.C. Print Competition: The Best Record Photograph.

Tuesday, August 29.

Bournemouth Camera Club. Print Competition.
Hackney Phot. Soc. Flashlight Photography. H. E. Corke.
Hammersmith Hampshire Ho. P.S. "On Truth to Nature." F. Bowen Williams.

Wednesday, August 30.

Dennistoun Amateur P.A. Compiling Winter Syllabus.
Rochdale Amateur Photo. Soc. "Development of the Plate." A. F. Barnes.

Thursday, August 31.

Sheffield Photo. Soc. Outing to Ecclesall Wood.

Saturday, September 2.

Bedford Photo. Soc. Visit to the Works of the *Yorkshire Observer*.
Dennistoun Amateur P.A. Outing to Uplawmoor.
Edge Hill Camera Club. Outing to Neston and Parkgate.
Exeter Camera Club. Outing to Powdesham Park.
Partick Camera Club. Outing to Kilsyth and Banton Loch.
South Glasgow Camera Club. Outing to Coatbridge.
South Suburban Photo. Soc. Outing to The Zoo.

News and Notes.

The Rotherham Photographic Society's Annual Exhibition will be held in the Drill Hall from October 18 to 21 next. Particulars may be had from the exhibition secretary, S. G. Liversidge, Orissa, Gerard Road, Rotherham.

Exhibition at Turin.—An exhibition of photographic and optical goods, including cinematograph apparatus and appliances, is to be held at Turin during the month of April, 1923. The Turin Chamber of Commerce state that the exhibition will be of an international character.

Death of Mr. H. W. Blunt.—We regret to have to record the death of Mr. H. W. Blunt, of Southport, who died on the 15th inst. after an illness of nearly two years' duration. He was a partner in the photographic firm of Starfield and Co., of Renshaw Street, Liverpool, and a director of Leslie Bros., Ltd.

Camera Smuggling.—At Dover, last Saturday, a man and his wife coming to London from the Continent were each fined £44 14s. for smuggling four cameras and two pairs of binoculars. The Customs official, prosecuting, stated that only a severe penalty would stamp out camera smuggling, which was getting rife, as cameras could be bought for next to nothing on the Continent.

Press Photographs are often "turned down," says the "Newspaper World," because of an insufficiency of details supplied by the contributor. Particulars of the occasion such as the date and names, etc., in full, cannot be given too carefully. It is not neces-

sary to write out a smart caption, as this is almost always done by the editorial staff, although, of course, a really bright idea is welcomed.

EXHIBITION SENDING-IN DAYS.—Readers who intend sending in pictures to the two London exhibitions are reminded that Wednesday next (30th inst.) is the last day for receiving entries for the London Salon of Photography (5a, Pall Mall East, London, S.W.1), and that to-morrow (26th inst.) is the last day for receiving pictures for the Royal Photographic Society's exhibition (35, Russell Square, London, W.C.1).

PHOTOGRAPHER FINED FOR OBSTRUCTION.—It is stated by the local Press that visitors to Cheddar Gorge are importuned by a small army of photographers to have their portraits taken. But, according to the police, their persistence has developed into a nuisance, and last Saturday one of them was summoned at Axbridge for causing an obstruction, and was fined 5s. He said he was one of six ex-soldiers who were trying to earn a living by photography in the district.

BROCKEN "SPECTRE" PHOTOGRAPHED.—A Reuter wire from Paris states that the photographers belonging to the party that has accompanied Professor Legarme, the French scientist, to the summit of Mont Blanc have succeeded in photographing the so-called "Brocken spectre" for the first time. The Brocken spectre, it may be stated, is an optical phenomenon caused by the sun's projection of the shadows of the summit and the objects on it in gigantic proportions on a wall of mist.

THE ALL BRITISH £3,000 COMPETITION.—A very interesting 16-page booklet describing this competition has been issued, and copies of it may be had from dealers or from the secretary, All British Competition, 4, Oxford Street, London, W.1. In addition to reproductions of some of the prize pictures, the booklet contains much useful information on starting photography, and a capital reproduction of a photograph showing the judges at work on the first section of the competition.

PHOTOGRAPHING CHARRED DOCUMENTS.—The American scientific papers tell how records charred beyond recognition in a fire at Augusta, Ga., have been made legible by the Bureau of Standards. Renovation by chemical means having failed, Raymond Davis, chief of the photographic laboratory, laid the charred sheet between two photographic plates with the emulsion side next the paper. After two weeks of contact the developed plates gave a plainly readable record. Where there was contact between the charred paper and the plate the latter was affected, but where the ink had been the chemicals of the plate were unchanged.

CHARGES FOR ELECTRICITY SUPPLY TO PHOTOGRAPHERS.—The question has arisen in various Northern centres as to the terms for electricity which local authorities should concede to photographers. In Blackburn (says "Electricity") a scheme has been introduced whereby power rates are charged certain hours when the studio is likely to be in use, the period being extended in the winter when the light is not so prolonged. In other quarters, power rates are charged for all photographic work, the Committees holding the opinion that this comes within industrial occupation. The whole subject is likely to be brought forward in the near future with a view to securing some degree of uniformity in the country.

A FRENCH PIONEER OF PHOTOGRAPHY.—The claims of an almost forgotten pioneer of photography, Hippolyte Bayard, are being urged by the Parisian press. Bayard, a native of Breteuil, says one French authority, is said to have invented the first process for photography on paper, which he communicated to the Academy of Sciences in 1839, while Niepce and Daguerre were still experimenting without success. He had then produced the first positive picture on paper, and soon afterwards was the first to develop the latent images on paper. For nearly fifty years afterwards he continued photographic research, but his name was quite forgotten soon after his death. "France," says the *Matin*, "must take better care of her glories." As briefly stated on page 509 of the current "B. J. Almanac," Bayard had on June 4, 1839, an exhibition of positive prints made directly in the camera.

MICROGRAPHIC PHOTOGRAPHY IN TEXTILE TRADE.—Reuter's New York representative states that a local scientist of Boston, U.S.A., has opened a studio for the purpose of specialising in micrographic photography. The business consists of making photographs of textiles, jewels, and other extremely small objects or details of objects for purposes of identification or reproduction. For example, if a merchant wants a sample of cloth reproduced, he has micrographic photographs made of the goods showing details of the fibre in the threads, the tightness or the looseness of the twist, and details of design. Such photographs, it is said, are of much assistance to the textile maker in reproducing goods, and to the purchaser in determining whether the reproduction is truthful. The micrographic pictures also easily identify various kinds of threads, whether they be silk, wool, or cotton.

P.P.A. CONGRESS: ASSISTANTS' EVENING.—As announced in the first issue of the "Record," the President and Council of the P.P.A. invite all photographic assistants as their guests at the Prince's Galleries, Piccadilly, on Thursday, September 14, from 6 p.m. to 10 p.m. This evening has been set aside entirely for them, and it is hoped that all who possibly can will be present. There will be a talk by Mr. Marcus Adams on the exhibition of pictures, and Mr. George Hana will give a short address on "Assistants as Associate Members," after which a short discussion will be opened. During the evening the result of the "Window and Show-Case Dressing Competition" will be announced and the awards distributed. Refreshments will be provided and musical items rendered. It is the earnest desire of the President and Council to make this evening a great rally for assistants where they can feel at home, and preparations are being actively proceeded with to receive a record number of visitors. No charge of any kind will be made, the Council inviting the assistants to come as guests of the P.P.A. Invitation cards are now available and will be supplied to employers who make application to Mr. Gordon Chase, Bromley, Kent. Early application should be made, and in no case later than August 31. Members of the P.P.A. may invite all their assistants, but non-members are restricted to two invitations.

AN ANALYSING ATTACHMENT for cameras is described in the "Optician" by C. F. Smith, who writes: In view of Professor Cheshire's recent advocacy of the Nicol prism for viewing pictures in galleries, a description of an analysing attachment for cameras may be of some interest. In the early part of last year the author noticed accidentally that transparent objects, or objects possessing a transparent surface layer, had the property of polarising reflected light, the degree of polarisation being dependent on the angle of incidence. This fact suggested a solution of the reflection problem, one which has always troubled professional photographers when photographing glassware, furniture, or interiors. All that was necessary was to attach a suitable analyser to the camera, and adjust until the most annoying reflexions were wholly or partially suppressed. A few experiments showed that a plate of tourmaline was the best form. The angle of field of a Nicol prism was too small; a pile of glass plates arranged obliquely to the axis spoilt definition, while a black glass reflector meant twisting the camera into very awkward positions. The tourmaline is about one millimetre in thickness, and can be attached in the same way as a filter, i.e., normal to the axis. The colour, which is usually a pale yellow or green, has the objection of increasing exposure by about four times, but otherwise the performance is satisfactory. Two interesting photographs of some household objects accompany the article, the exposures being made with the tourmaline in its positions of minimum and maximum effect.

Correspondence.

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

No notice is taken of communications unless the names and addresses of the writers are given.

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

PACKING NEGATIVES.

To the Editors.

Gentlemen,—May I be permitted to supplement your useful "Ex Cathedra" remarks on "Packing Negatives" by pointing out that although negatives packed in card plate-boxes, and surrounded by corrugated paper, may come safely through the post in nine cases out of ten, as you mention, yet the fact should never be overlooked that if the parcel has heavy pressure applied (as is often the case when at the bottom of a pile of parcels) no amount of corrugated will prevent such pressure being transmitted to the glass?

Speaking from long experience, one of the most frequent cause of breakage is allowing lateral shift of the negatives in the plate-box. If not in envelopes they should be wedged all round with tissue paper. It is also inadvisable to include more than one size of plate in a plate box. If this must be done, a stout card the same size as the larger negatives should be placed on top of them; the smaller wrapped tightly in a parcel (secured with gummed strips or string) and then stuck to the card with gummed paper, the space around being filled with soft packing.—Yours faithfully,

E. A. S.

THE "FREE SITTING" AGAIN.

To the Editors.

Gentlemen,—With reference to the letter of Mr. H. M. Robinson on this subject, in the "B.J." of August 11, may I point out that while many photographers will agree with him that there are occasional cases in which a "free sitting" is a legitimate business proposition, yet his contention that "no harm is done to brother photographers" by those professionals who make a regular thing of the "free sitting" stunt, is negatived by the fact that these indiscriminate invitations do certainly induce an idea, in the mind of people receiving them, that photographic work must be very easily and cheaply produced if it can be given away so freely, and that, consequently, the photographer who asks a good price is a profiteer of the worst kind. I have had this point of view put before me more than once by members of "*the* profession" who have assured me that they could get as many photographs as they wanted taken for nothing!

Then, again, there are other people who look upon these "free sitting" offers as an attempt of the photographer to foist his wares upon them or to make a profit out of them, and who consequently, when they want photographs, prefer to pay for them, and not run the risk of the photographer making some use of their portraits to which they might object, it appearing to be pretty well known by this time that by giving the "free sitting" he acquires the copyright of the pictures taken.

In the course of my own practice I have recently had more than one sitter, of some public importance, come to me in preference to accepting "free sitting" invitations, and the "stunt" thus appears to defeat, at times, its own purpose. Probably almost the only cases in which it pays to give "free sittings" are those of local clergy, for whose portraits, sold, of course, by their permission, there is very often a good local demand; and there are occasionally other local celebrities whose pictures may make a good showcase draw, but beyond this I do not think it is wise for the average photographer to go.—I am,

Yours faithfully,

DRINKWATER BUTT, F.R.P.S.

2, Margravine Studios, Baron's Court, W.6.

THE QUANTUM THEORY OF PHOTOGRAPHIC EXPOSURE: A CRITICISM.

To the Editors.

Gentlemen,—The criticism ("B.J.," July 28, p. 443) by Mr. F. C. Toy of the experiments of Messrs. Trivelli and Righter, and the quantum theory of exposure of Dr. L. Silberstein is, of course, quite in order, and its main contentions will be answered by these authors in due course. There is a possible implication, however, in Mr. Toy's argument upon which the writer would like to comment. Mr. Toy, referring to a statement of Silberstein, says "The first and most natural assumption of all is that the grains themselves are different; from the chemical point of view there is no reason why this should not be the case." The possible implication is that this alternative point of view was not considered in this laboratory. On the contrary, in a paper on "The Size Frequency Distribution of Particles of Silver Halide in Photographic Emulsions and its Relation to Sensitometric Characteristics," by the writer, in conjunction with E. P. Wightman and A. P. H. Trevelli, an alternative view of chemical differences between the grains, as due to localised sensitiser, is fully discussed and compared with the quantum theory of exposure. This paper was sent to the "Photographic Journal" in abridged form (abridged because the "Journal" does not publish lengthy papers) on March 27, and acknowledged April 19, but was rejected by the Journal Advisory Committee. The full paper is to appear in the "Journal of Physical Chemistry," while the abridgment is included in the first of a series of papers on "Studies in Photographic Sensitivity," to appear shortly in the "Journal of the Franklin Institute."

This letter has been written, not to deal with Mr. Toy's criticisms of the quantum theory, but to explain why the alternative view of grain sensitivity, which he regards as most natural (as it is to a chemist, though not perhaps to a mathematical physicist) did not appear to have been canvassed in this laboratory. It has been, but the circumstances referred to have delayed the public statement. As to the main question at issue, it has appeared to the writer for some time that the best chance of an *experimentum crucis* lies in the application of desensitisers as follows:—

1. It must be possible to remove completely the desensitiser prior to exposure. Otherwise the desensitising effect may occur by destruction of nascent latent image.

2. If this condition is secured, previous treatment with a desensitiser (chromic acid is being tested *inter alia*) should destroy the localised sensitiveness, if such a chemical difference is the cause of differential grain sensitivity.

3. If the original quantum hypothesis of Silberstein is correct, desensitising of the type described would not be possible, and the same differential grain sensitivity would exist before and after treatment.

Micro-chemical experiments with one-grain layers on these lines are being carried out by the writer and his collaborators, and the results will be communicated as soon as available.—Yours faithfully,

S. E. SHEPPARD.

Research Laboratory of the
Eastman Kodak Company,
Rochester, N.Y.,
August 10, 1922.

SCRATCHED V.P. NEGATIVES.

To the Editors.

Gentlemen.—With reference to your remarks in "Ex Cathedra" of August 18 regarding scratched V.P. negatives. If enlargements are made with the mercury vapour lights, scratches on the back of either film or glass negatives do not show, and any retouching on the film side is much less apparent than when enlargements are made through a condenser.

We fully endorse your remarks *re* the packing of negatives for post or parcels delivery in every respect, and would add that a wooden case with open ends is not entirely safe. The box should be strongly made, with a lid either nailed or screwed on. We are at all times pleased to send suitable boxes free of charge to any photographers requiring prints or enlargements from us.—Yours faithfully.

Raines and Co. (Ealing), Ltd.,
R. H. CHENNELL,
Managing Director.

THE RENOVATION OF DAGUERREOTYPES.

To the Editors.

Gentlemen,—An article in the "British Journal" of August 4, p. 458, appears to me to be so likely to bring disaster on the photographer who may place reliance on it that a warning is desirable in his own interest, as well as that of the owner of the treasured and irreplaceable record.

I have been informed of a case in which a Daguerreotype was entrusted to a photographer of the highest standing with a commission for copies and paintings amounting to about £150, but the Daguerreotype was spoiled by an assistant, whether by rubbing, by the long stay in cyanide necessary to remove deep-seated tarnish, or by other means, I do not know. Not only did the photographer lose the order, and probably the connection, but the patron had to be faced with the information that his priceless treasure was destroyed.

The first statement calling for criticism is that "a Daguerreotype image cannot be rubbed off by ordinary means." This may lead the photographer to suppose that he may safely try what has been the ruin of so many Daguerreotypes, an endeavour to remove tarnish by rubbing with a cloth.

What is the object of the preliminary immersion in spirit? Is the writer confusing glass positives with Daguerreotypes? Positives were sometimes varnished with a solution of gums in alcohol,

sometimes with a material not soluble in spirit, and commonly not varnished at all. Of the very many Daguerreotypes that have passed through my hands, I have never seen one that was varnished, or that from any reason required a bath of alcohol.

The next proposition to challenge is that the cyanide and hydrochloric methods are equally effective. Later on, however, the writer states that "cyanide, if given time, will act upon the picture itself." This is only what might be expected from the well-known action of cyanide on gold and silver. Cyanide is in extensive use for extracting gold from the ore, and in the extremely finely divided state in which gold is deposited in toning Daguerreotypes, its removal by cyanide is probably almost instantaneous. The added beauty and vigour resulting from gold-toning were so well recognised that probably few, if any, Daguerreotypes were made without it during the greater part of the period of their professional production. The loss of this beauty may not be noticed by the user of cyanide, as he has not the picture in its original state to compare with it after the loss. With the hydrochloric method I have removed tarnish so deep-seated that it is doubtful if any useful image would be left if the cyanide treatment had been continued long enough to remove the tarnish, and in the end the image was not only intact, but the beautiful rosiness of a well-toned Daguerreotype was in full evidence.

The last point to notice is the statement that the Daguerreotype is to be removed directly from the tap to the drying flame. There may in some places be a supply of tap water so soft that this may be done, but generally there is so much lime in the water that lines or patches of deposit will be formed, unless, as was regularly done by Daguerreotypists, a rinse in distilled water is given before drying.—Yours faithfully,

W. E. Debenham.

311a, Finchley Road, N.W.

"OPERATOR" OR "POSEUR."

To the Editors.

Gentlemen,—We all detest the word "operator," but "poseur" will not do in place of it. The word "poseur" now refers to one affecting a "pose," and has this significance—that it already is used to denote a person who puts on airs—a "swanker." There would be constant confusion in the studio with this term, for the poseur is really the posee. What is wanted is something exactly to take the place of the hated word, and which will indicate that branch of photography now known as operating. How would "camerist" do? Surely no one could object to be called a camera artist!

I must thank your correspondent for the flattering things he says about my articles, all the more as I learnt a good deal of my business in his city. I had a studio in Liverpool nearly thirty years ago.—Yours faithfully,

J. Eyre.

TONING WITH TIN SALTS.

To the Editors.

Gentlemen,—The solution of potassium ferricyanide and ammonium bromide, recommended as the bleacher for sulphide toning in the "B.J. Almanac" for 1922 (p. 483), converts a silver image almost quantitatively into one of silver bromide. This has but little bearing, however, on the explanation of the chemistry of the Neugschwender process of toning with stannous salts, indicated by J. G. F. Druce in the July 21 number of the "B.J.," inasmuch as the reduction of silver bromide by sodium stannite solution may be expected to follow a similar course to the reduction of silver ferrocyanide—the salt stated by Druce, through some misapprehension, to be the product of the action of the ferricyanide-bromide bleach solution on the silver of any image.

The equation in col. 1 of p. 433, in the above-mentioned article, should read:—

$$2NaHSnO_2 = Na_2SnO_3 + Sn + H_2O.$$

It is worthy of mention that this decomposition was described by Ditte in the course of a lengthy and fairly exhaustive paper on the action of acids and alkalies on stannous oxide, in the "Annales de Chimie et de Physique," ser. 5, vol. 27, in 1882. And analyses were given for the product of the reaction between potassium ferricyanide solution and silver metal, both when in the form of a photographic image and as a powder in glass vessels, by Lumière and Seyewetz, in a paper on the composition of the silver image toned with various metals, in the "B.J.," vol. 52, in 1905.—Very truly yours,

E. R. Bullock.

Eastman Kodak Co., Rochester, N.Y.
August 9, 1922.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

B. W. S.—You cannot do better than make a carbon transparency, which would reproduce the scale of tones in the original negative more correctly. Use a slow film for the negative.

C. A.—Any colour sensitive plate gives very little correction if used without a colour filter. There is an improvement with "Anti-Screen" or "Self-Screened" plates, but nothing like what you would obtain with even a K2 filter. We should advise you to get for your special work a K2, or even a K1, screen, and use the panchromatic film.

G. E. C.—"Ferric and Heliographic Processes," by George E. Brown, is now out of print, but you could possibly obtain a second-hand copy from Messrs. Foyle, 121-123, Charing Cross Road. We assume that you wish to render the indian ink more opaque for copying by ferro-prussiate. If so, we do not think you can do better than to add a red or yellow pigment. The aerograph colours sold by Winsor & Newton, 37-40, Rathbone Place, Oxford Street, W.1., should answer very well for this.

D. O. P.—The soda sulphite should be in clear crystals. It should be kept well corked, otherwise the crystals become dull and powdery. Such sulphite must be rinsed for a few seconds, in a measure, with enough cold water to cover it, the water poured away and the crystals dried on a clean cloth and weighed out. Warm water, not hot or cold, is the best to use. The ordinary form of sulphite (to be used in all formulæ, unless otherwise directed) is the "cryst." The "anhydrous" is a stronger variety, 1 part of which is equivalent to about 2 parts of "cryst."

R. H. J.—The trouble with the mounts is an old one, and with the cheap quality pulp board you use we are afraid that you will not be able to get over it. Cardboard makers manage to obtain flat boards by keeping them under pressure while drying, but this would be difficult with a gelatine emulsion surface. You might try hardening the prints in formalin, and then when surface dry, before they begin to curl, putting them under pressure, say, a large board with a couple of 56-lb. weights. Another plan, which has answered with smaller prints, is to put them while damp in a set of grooves rather narrower than the card, so as to put a strain on in the reverse direction while drying. When taken out dry they should be practically flat.

F. G. A.—A formula for dextrine mountant is:—

Best white dextrine	1 lb.
Cold water	to make stiff paste.
Water	10 ozs.
Oil of wintergreen	1 dr.

Mix the dextrine and water together in small doses of each, so as to ensure a mixture free from lumps and clots. Dilute with the further quantity of water, add the oil, and just bring the whole mixture to the boil, when it should be like clear gum. Pour into pots, cover up, and in from 12 to 24 hours it will be set to a hard and white paste of great adhesive power. The dextrine must be the best white; inferior dextrine remains treacly on cooling.

H. H. N.—In the case of negatives on celluloid cut or roll-film the following is a suitable method for stripping:—

Caustic soda	10 grs.	23 gms.
Formaline	10 minims.	20 c.c.s.
Water	1 oz.	1,000 c.c.s.

The celluloid negative is immersed in this solution until the film shows signs of detachment and can be rolled back with the finger. It is then placed in

Hydrochloric acid	25 minims.	50 c.c.s.
Glycerine	25 minims.	50 c.c.s.
Water	1 oz.	1,000 c.c.s.

in which it is removed from its original support to a glass or other base.

H. F.—The following one-solution metol developer would suit your purpose:—

Metol	150 grs.	17 gms.
Sodium sulphite	2½ ozs.	125 gms.
Sodium carbonate	3½ ozs.	175 gms.
Potass. bromide	16 grs.	1.8 gms.
Water	20 ozs..	1,000 c.c.s.

In making up all metol developers, dissolve the metol first, then the sulphite, and then the other chemicals, using warm but not hot water. For portraits, take stock solution, 1 oz.; water, 1oz. For landscapes, stock solution, 1 oz.; water, 2 ozs. Metol gives delicate negatives with great detail and little density unless development is greatly prolonged.

G. W. F.—You do not specify the size of negatives which you intend to take, so that it is difficult to indicate a suitable focal length. For cabinet heads nothing shorter than 14 inches is desirable, and for whole-plates at least 16 inches is needed. This ignores cartes and other small sizes for which a second lens is almost an essential. The standard outfit used to be a 10½-inch or 11-inch portrait lens working at *f*/4, and a 17-inch or 19-inch *f*/6 for large heads and general work up to 12 by 10. Dallmeyer's 3B and 4D or 5D are typical examples. If the extra cost is not an objection, anastigmats of these focal lengths and apertures would, of course, be better, especially if they have the soft focus adjustment. Your scheme for half-watt lighting is quite good, but if you had the lamps to raise and lower you could do with smaller candle power.

V. A. D.—(1) The ferro-prussiate print marked A is particularly good. (2) The Pellet process is for copies of line drawings only. From an ordinary tracing it gives a copy in blue lines on a white ground. The formula is:—

A.—Pure gum arabic	4 ozs.	200 gms.
Water	20 ozs.	1,000 c.c.s.
B.—Ferric ammonium citrate ...	10 ozs.	500 gms.
Water	20 ozs.	1,000 c.c.s.
C.—Ferric chloride (crystallised) ...	10 ozs.	500 gms.
Water	20 ozs.	1,000 c.c.s.

Add 8 vols. of B, then 5 vols. of C to 20 vols. of A, in small doses with constant stirring. The prints are developed on 10 per cent. solution of potass. ferro-cyanide and "fixed" in 1 : 25 sulphuric acid (specific gravity 1.84).

L. T.—If the dry plates have been kept in an unopened box and in a dry place, free from chemical fumes, they should produce passable negatives. The developing formula advocated is pyro-soda, viz.:—

No. 1 Pyrogalic acid	¼ oz.	25 gms.
Sulphuric acid	5 minims.	1.0 c.c.
Distilled water to make ...	10 ozs.	1,000 c.c.s.
No. 2. Carbonate of soda	2 ozs.	200 gms.
Sulphite of soda	2 ozs.	200 gms.
Potass. bromide	60 grs.	14 gms.
Distilled water to make ...	10 ozs.	1,000 c.c.s.

For studio use, 1 part of each and 2 parts of water (making 4 parts altogether) will be found about right. Such developer contains about 3 grs. pyro and 22 grs. each of carbonate and sulphite to each oz.

A. J.—Many bromide and gaslight papers will readily curl when laid down on the hand, the coated side assuming a convex shape. Also, the coated side, if one corner of a sheet of paper be touched with the moistened finger, will be felt as sticky, owing to the softening of the gelatine coating. A further method of telling the coated side is to go by the burred edge of the sheet, which usually stands up slightly from the film side. Still another method is to hold the paper bent in the form of an arch between the eye and the dark-room light. The line of light along the outer top of the arch or loop will indicate the nature of the surface. Glossy or semi-matt paper may be instantly recognised by its appearance. In the case of matt paper the emulsion side appears perfectly smooth and even, whilst, in comparison with it, the paper side has a distinct sheen. In the case of rough papers the emulsion side shows scarcely a trace of any line of light.

R. P. S.—Of the particular ways in which collodion paper is liable to give rise to failure the one which is least likely to be suspected is the tendency of the paper to develop yellow spots, or general fading of the image as the result of slowness in drying. This applies equally to prints which are trimmed wet and mounted at once. Whether unmounted or mounted, prints require to be placed so that they become perfectly dry within an hour or two. If they are mounted, the drying arrangement should be such that the mounts themselves also are not left retaining moisture. For this, mounts should be placed on a wire rack so that air can circulate freely round each and then put to dry in a warm, well-ventilated room. Once prints have become perfectly dry they seem to withstand the action of moisture perfectly well, collodion prints frequently withstanding moisture in outdoor showcases by no means rainproof without suffering in any way. The prints are also particularly liable to defacement by black spots mainly caused by minute particles of metal detached from metal cutting shapes, such as require to be used when trimming to ovals or circles. For rectangular prints the guillotine pattern of trimming board avoids this form of trouble.

F. M.—The method of making reversed negatives by ammonium persulphate, to which you refer, is as follows:—A lantern or other thinly-coated slow plate is placed in contact with the negative in a printing frame and a full exposure given such as would be thought advisable in making a soft positive transparency. The plate is developed with a clean working developer until the shadows appear quite black on the glass side of the plate. The time of development may be five times as long as for an ordinary transparency. The latter is then washed and placed in a 2 per cent. solution of ammonium persulphate until the silver image is seen to be removed. The plate is then thoroughly washed and developed in any clean developer containing about half a grain of bromide per ounce. It is then fixed and washed and dried. After the first development the operations may be done in weak daylight or artificial light. The action of the persulphate should be as complete as possible, otherwise a veil is left over the negative. Direct positives, but reversed from right to left, from engravings, etc., may be made in the camera by substituting bromide paper for the plate. The exposure should be full and the development as above. The method has this advantage, that the lines are rendered in the same degrees of black and grey as in the original, a point of some importance, since the lines in an engraving are seldom, if ever, of uniform blackness.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3252. Vol. LXIX. FRIDAY, SEPTEMBER 1, 1922. Price Fourpence.

Contents.

SUMMARY.

In a leading article we have something to say on the conditions in which a portrait photographer, who is working more or less without assistants, may take advantage of the services in printing, enlarging, etc., of the various trade firms. (P. 518.)

A cheap and easy form of electric lighting, using the Barkay reflector and reflected light, is dealt with by a practical worker who has forwarded us many beautiful examples of his work. (P. 519.)

Some hints on the photography of domestic interiors are given in a note on page 520.

Complaints of the quality of trade work which come before us almost invariably disclose the fact that the work was offered or advertised at an extremely low price. (P. 518.)

A problem of somewhat frequent occurrence in calculations relating to depth of focus is that of the distance upon which one should focus in order to obtain objects at given further and nearer distances in equally sharp focus—in other words, how to obtain the best distribution of definition. The formula for the distance upon which to focus is a very simple one, and also readily permits of ascertaining the lens stop which is required in order that the definition of the nearer and further points should conform to a given standard. An outcome of it is the series of consecutive depths of field sometimes used in depth focussing scales. (P. 521.)

In a paragraph on page 517 we refer to the exception, provided by the telephoto lens, to the rule that the camera back should be swung vertically when the camera as a whole is tilted.

Assistants' goodwill in their work is, we fear, often largely lost to a business by working conditions which involve great expenditure of what should be unnecessary labour. (P. 517.)

In the use of a reflex camera a short-focus lens may usefully form part of the equipment for the purpose of photographing, approximately same size, such subjects as pieces of mural writing, carving, etc. (P. 518.)

System in half-tone operating is the subject of an interesting letter from a Calcutta correspondent. (P. 527.)

"COLOUR PHOTOGRAPHY" SUPPLEMENT.

A French experimenter describes in a patent a photochromoscope and camera in which the three negatives are taken simultaneously. The apparatus is for viewing the additive colour effects as well as making the negatives. (P. 35.)

Some further reminiscences of commercial colour cinematography, with some notes on its possibilities, will be found on page 35.

Some up-to-date notes on Autochrome lantern slides are given on page 36.

EX CATHEDRA.

The Tilted Telephoto. Inasmuch as a fair number of lenses of the telephoto type are now in general use, it may be of service to draw attention again to one respect in which the telephoto lens differs from those of the ordinary type, since this concerns a point of practical procedure. As every photographer knows, in the use of a tilted camera it is necessary to swing the plate into a vertical position in order to obtain in the negative parallelism of vertical lines in the subject. There is, however, an exception to this time-honoured maxim. As was first pointed out some years ago by several users of the telephoto lens, with a lens of this type the back frame of a tilted camera requires to be neither in the vertical position nor in one at right angles to the base-board, but in a position intermediate between the two, as a condition of securing freedom from convergence of parallel lines in the subject. The observation of the practical workers has since been confirmed by the scientific optician, who has shown that this peculiarity is inherent in the telephoto type of lens. Now that fixed-focus telephoto lenses are sometimes sold without an indication that they are of the telephoto type, this caution may perhaps prevent the less-informed user from falling into the error that there must be something seriously the matter with his lens because it does not behave like one of the ordinary type in giving freedom from converging lines when the camera back is swung level.

* * *

Efficiency. Among employers of photographic labour there is, we fear, too often the tendency to regard the efficiency of an assistant as simply and solely a question of his or her competency in work. While there are always people who will misuse the best means which are provided to facilitate their work, we have very frequently observed conditions in photographic establishments which make highly efficient work an impossibility. Many employers require to realise that it is destructive of the assistant's good will and cheerfulness in his work that the arrangements should necessitate a large proportion of what should be unnecessary labour. In highly-organised industries on the large scale an immense amount of thought is given to the elimination of unnecessary labour, and the same degree of attention is required in the smaller establishments, such as those engaged in the making of photographs. Yet, to cite a state of things which we have several times seen with our own eyes, an enlarging apparatus will be installed on a different floor from that where the dark room is situated. As a result, as much time is spent in running to and fro for making test exposures and for exposing the full size sheet of paper as would suffice in compactly arranged premises for doing the whole job. Yet, a bad arrangement of this kind would be defended for the strange reason that it had been in use for twenty years. Very often inefficient organisation of this kind goes hand-

in-hand with long working hours. The two together are responsible for a condition of persistent fatigue among the assistants by which their ability progressively decreases to a low ebb. We are convinced that there are many employers who have much to gain by critically scrutinising their working arrangements, even though these may have been devised by themselves, say, ten years ago.

* * *

Reflex and Short Focus Lens. Perhaps the one respect in which the reflex camera fails those who would possess a hand camera having all the movements of a stand instrument is that the lens is necessarily of focal length a little greater than the long side of the plate, in order to allow room for the movement of the mirror. Hence the use of a wide-angle lens is a facility which is denied the reflex worker, at any rate for the normal operation of the camera. A Chinese inventor not long ago proposed to get over the difficulty by a device which was much more clumsy than the really elegant construction devised many years before by the late Mr. A. L. Adams, who caused the mirror to move down instead of up, and provided a blind to cover the focussing aperture. Even so, if special importance is attached to the use of a short-focus lens, the readiest plan is to fit it in a deeply-sunk mount and to keep the mirror up, focussing on a ground glass behind the shutter and dispensing with the use of the mirror. As such wide-angle photographs are usually required of still subjects, little is sacrificed by the use of a tripod when operating in this way. For another purpose, however, the short-focus lens is very useful in the normal employment of a reflex, viz., for copying same size with the camera held in the hand. We have often used a 3-in. lens on a quarter-plate reflex when photographing bits of mural writing, coins, and similar subjects approximately full size, and could wish for no better or more expeditious camera for such work.

* * *

Prices and Quality. The economic fact that prices of goods find their level in relation to their quality is one which, so it would appear, is scarcely realised by many of those who have dealings with firms offering trade work in the shape of prints, enlargements, etc. It is within our experience to receive from time to time complaints of the quality of enlargements or post-cards which have been executed to a photographer's order by one or other of the trade firms. Almost invariably, on the complaint being investigated, it has turned out that the work has been done at extraordinarily low prices. In these circumstances the buyer should certainly have realised that if he takes the risk of a price which may be a quarter of that charged by a first-rate firm, he cannot expect to be assured of a first-rate quality. In exceptional cases, as, for example, where a good trade worker is starting by his unaided labour and is seeking to attract customers by the indiscreet method of offering exceptionally low prices, the work may be astonishingly good at the price. But such discoveries must be few and far between; and almost inevitably a man who starts in business on this basis has to raise his prices as soon as his trade reaches such dimensions that he requires to employ assistants of skill comparable with his own. It requires to be borne in mind that an important difference between low-price and high-price firms is that the charges made by the former do not permit of unsatisfactory work being thrown out; instead, it has to be supplied to the customer. This distinction is probably a more frequent cause of unsatisfactory work than the use of poorer materials or cheaper labour. The low-price man, from his circumstances, is compelled to work to a price, whereas the charges of the high-price man allow him to work to his standard of quality.

THE USE OF PHOTOGRAPHIC TRADE SERVICE.

The long establishment of that branch of the photographic trade which undertakes printing, enlarging and finishing for portrait photographers may be taken as a sign that this service is widely employed and valued by photographers generally, and hence some notes on the best way of using these facilities may be of service to some making a start in studio portraiture and not so familiar as they should be with the measures to adopt in utilising the trade houses.

Generally speaking, this trade service is employed on one or other of two plans. One is to let the outside firm do as little as possible. The other is to let it do as much as possible. Naturally, there are degrees in the adoption of either plan, but the photographer, who, for example, is starting in portraiture "on his own" may well consider in which of these two directions he shall endeavour to work. If in the first, he will need to make provision for his printing, enlarging and finishing himself, or by means of a staff as his business grows, and will rely upon the trade firm for those special jobs which are beyond the scope of his facilities by reason of their nature or magnitude. On the other hand, if the plan be adopted of utilising a trade service to the utmost degree, the embyro portraitist is able to consider making his equipment of the simplest kind, and may perhaps be thereby enabled to take premises which otherwise would be impossible for his purpose. Although his prints, etc., may cost him more than if produced on the spot, he is relieved from the anxiety of keeping assistants employed when there is not enough for them to do, and, moreover, will almost certainly be able to draw upon a variety of work, such as he could not unaided expect to offer to his customers.

Those who follow the first of these plans, that is to say, make occasional use of the trade house, must be prepared for certain difficulties. It cannot be expected that the trade worker should be able by intuition to realise in what particular way an order is to be carried out, and the portraitist may easily receive a shock on the delivery of prints which he thinks much too dark, or too light, or in some other way a departure from his accustomed standard. In such circumstances as these his best course is to use the trade firm only for fairly large numbers, from a dozen upwards, and on no account to omit sending, with each negative, a finished print showing exactly what he wants. And plainly, in any circumstances, it is useless for him to expect satisfactory work at a cut price; he must be prepared to pay a price which will allow the trade firm to throw out prints which are not first-class, and, moreover, to permit the employment of experienced artists for the finishing and colouring. We sometimes receive complaints of the work turned out by trade houses, and are coolly requested to expostulate with them on supplying prints of such inferior quality. Almost without exception in such cases it transpires that the work is being done at the most miserable cut price, representing little more than a narrow margin on the cost of materials. Provided a decent price is paid and, what is equally important, plainly expressed typewritten instructions given to the trade house, preferably accompanied by a specimen print, to serve as a guide for vignetting, worked-in back-

ground, etc., the intermittent user of a trade service should have no difficulty in making valuable use of these facilities.

As regards the regular employment of a trade house for the great bulk of printing and enlarging work, probably the most favourable condition for this plan is the supply of clearly sighted well-finished portraits, such as form the output of a good middle-class business. The photographer will be well advised to adapt his style to that of the trade house. Such a course promotes the prompt delivery of work up to a certain standard, and a fairly high one at that, and eliminates a great many sources of misunderstanding. At the same time it must not be supposed that a trade house undertaking the regular work of a studio is unable to maintain a particular style and standard, agreed upon at the outset; such, in fact, is the arrangement which is regularly being carried out with satisfaction to both parties. The most prolific causes of delay and disappointment are almost inevitably the request for special tones, particularly in the case of small batches of prints. There is also the further motive in establishing regular relations with a trade house, namely, the opportunity which is naturally afforded for such customers to receive preference in being shown the firm's latest styles in finishing and colouring. As we have pointed out on previous occasions the photographer in a small town may often make extra sales of portraits, and at the same time add to the attractiveness of his displays, by ordering a few "speculative" portraits from his trade supplier.

INEXPENSIVE ELECTRIC LIGHTING FOR THE STUDIO.

The darker half of the year is fast approaching, and many photographers—particularly those in a small way of business and with no artificial light installation—will be turning their attention to the problem of taking portraits by the aid of gas or electric light, and my experiences with a simple form of electric light may be of some service.

I am a great admirer and a user of the Barkay reflector, which I believe is not in general use, as it deserves to be, among professional photographers who have electric light laid on. I find the reflector to be an ideal accessory, as I have no great love for the spot light. When first using the reflector, I was perhaps a little too impatient—as all who try it for the first time may be—but the system was quickly mastered, and the results obtained when using a single 1,500-c.p. half-watt lamp in conjunction with the reflector are extremely satisfactory. I get a satisfying and comforting kind of light, of the kind that minimises all worry about exposure with nervous subjects, children, or babies. It is a powerful light, but one that is surprisingly soft and subdued.

At present I am getting with this lighting beautifully illuminated and fully exposed negatives on orthochromatic plates of H. and D. 400, 500, 550 and 600 speeds, with a maximum of one-quarter of a second's exposure.

For small work I have in use a modern anastigmat lens of 5½-inch focus and working at f/4.5, and for postcard size and cabinets I have another anastigmat of 8¼-inch focus and working at f/5.6. I stop down the latter, however, to f/6.5 for groups, and expose by opening and closing the shutter as quickly as possible, this being the longest exposure I give at any time. The resultant negatives are invariably crisp, full of detail, and have finely graded half-tones—in short, all that could be wished. My earliest efforts with the light were not very satisfactory, because—like everything else—the use of the reflector must be fully understood before one can secure the finest results.

The reflector was installed early in April last, and I chose the No. 4 model, hanging from the ceiling, the reflector being of the H type. It was first used as a direct light, as I believe it is commonly used, using butter muslin as a screen between light and sitter, but the results were not what I required. Light was enormously increased, but the negatives I secured were a little too hard, and the light much too bright, and very uncomfortable for the sitters, because of an enforced nearness on account of limited space. It was next tried with blue tracing linen as a screen or filter, and this was a decided improvement, and one which gave a much softer effect both in the lighting and the negative, but still rather trying to the sitter's eyes. The next experiment was to have the wall against the light covered with a white paper having a silvery sheen; the lamp and reflector were then reversed (the reflector being between the sitter and light), and the light reflected from the papered wall used in place of direct light. This arrangement was a great success, as the light spreads everywhere with a soft and subdued radiance, and does not dazzle the eyes of the sitters.

The fitting allows of the light being moved or adjusted very quickly to any requirement. The pendant-fitting is 58 inches

Fig. 1. Portrait taken by reflected light from the Barkay reflector. Stop F. 5.6; plate, isochromatic, H. & D. 500; exposure, ½ second.

long, and consists of four sections (three hinges), each of which swings through an arc of 330 degrees at right-angles to the one above, the two longer arms rotating in their own length, thus reaching any point within the hemisphere, making it suitable—when used in the ordinary way—for high or low lights, front, side or back lights.

Mention is made of four different plate speeds used because I am experimenting very extensively with different makes and

speeds, making notes and comparisons with a view to making a final and decisive choice of a plate that I shall use and keep to. All are good, but I want the best.

With this reflector a certain amount of caution is advisable, and the operator must always see that the illumination is even, especially in the lower front part of the field of vision, otherwise a little local under-exposure may perhaps be met with, but still nothing that cannot be dodged in the printing. With this reflected light there is little or no retouching required in small work, and very little on postcard and half-plate negatives.

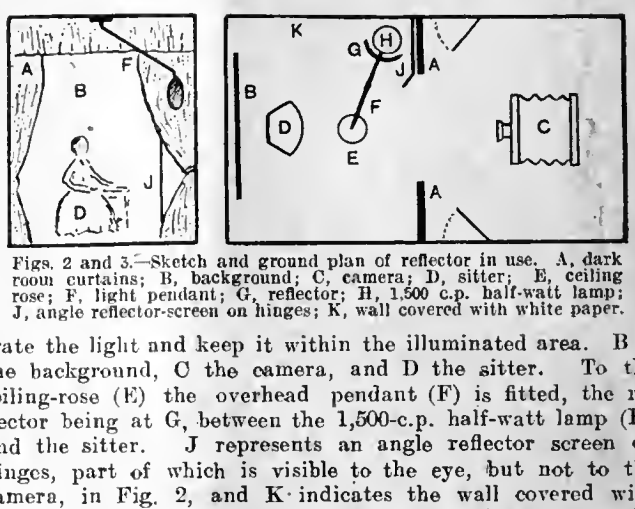
The overhead No. 4 model is certainly a most useful fitment; and I can only suggest that universal joints would be a great improvement, as they would enable the operator to turn the arms to any position required, using only the hand and without having recourse to either wrench or pliers.

The makers of the reflector claim that it increases the light by upwards of 800 per cent., which is, to my mind, a very moderate estimate. My studio is a small room, and the light can be even more concentrated by means of curtains and a hinged reflector, as shown in the diagrams.

The H-type reflector is really a spot light fully extended, and is very brilliant. No electric light studios can afford to ignore the advantages offered by the use of these reflectors, as by their means operators can either increase their present lighting some hundreds per cent. at no extra cost, or they can do away with three-quarters of their lamps and yet have a more powerful light.

The reflector turns a good light into a super light, and work is improved accordingly. Unless the lighting be seen, it is almost impossible to realise how soft, and yet powerful, it is.

Fig. 1 is a child portrait taken by means of reflected light; *f*/5.6 was used, and a quick "open and close" shutter exposure given, approximately one-quarter of a second. Fig. 2 gives an idea of how the setting appears to the operator when at the camera, and Fig. 3 is a plan of the studio. In Figs. 2 and 3 the fittings are indicated by reference letters, as follows: A, dark curtains at side and top of opening to concentrate the light and keep it within the illuminated area. B is the background, C the camera, and D the sitter. To the ceiling-rose (E) the overhead pendant (F) is fitted, the reflector being at G, between the 1,500-c.p. half-watt lamp (H) and the sitter. J represents an angle reflector screen on hinges, part of which is visible to the eye, but not to the camera, in Fig. 2, and K indicates the wall covered with white paper with a silvery sheen, a medium which reflects the light and makes it possible to secure well-exposed negatives under the very simple conditions described.



Figs. 2 and 3.—Sketch and ground plan of reflector in use. A, dark room curtains; B, background; C, camera; D, sitter; E, ceiling rose; F, light pendant; G, reflector; H, 1,500 c.p. half-watt lamp; J, angle reflector-screen on hinges; K, wall covered with white paper.

R. P. Rudd.

THE PHOTOGRAPHY OF DOMESTIC INTERIORS.

[Many helpful hints are contained in the following article, which we reprint from our Philadelphian contemporary, "The Camera." Although written primarily for the amateur, who is supposed to know little or nothing of the photography of domestic interiors, the professional worker will find many useful hints and reminders which will be of service in practical work.]

The chief thing in arranging an interior for the camera is to make things look "as if they had not been arranged, but are just as they usually are." A pipe laid across an open book, an open letter and torn envelope, a hat and gloves, an open work-basket, these and half a score similar objects will suggest themselves to the reader as personal touches indicating that the room is not a "withdrawing" room for state occasions, but a living room in daily use.

There is no hard and fast rule as to lighting, but as a very general and practical guide we may say that the most picturesque effect will not be obtained when the sun is exactly in front of the window. With the sun a little to one side or the other we get an oblique and far more pictorial and interesting effect.

Bear in mind that the lens tends to exaggerate and distort the objects nearest to it. A small round table near the lens and appearing in the corner of the foreground will probably come out far too large, and, perhaps, oval in shape. To move the table from its accustomed place and away from the camera will probably give an unusual arrangement and also make the room look crowded and arranged, but if omitted altogether its absence will not be detected.

The point of view is most important. The commonest fault is pointing the lens into the opposite angle or corner of the room. This gives us a vertical line down the middle of the print. If one side of the room is darker than the other, then point the lens slightly toward the darker side. The next fault is having the lens too high above floor level. The smaller the room the lower the view point is a good rule, and 42 inches to 5 feet will be found a useful working margin.

The best thing to prevent tripod points slipping is a rug or carpet on which to stand the tripod. If these cannot be obtained, then use a long piece of string and give it three or four turns round each leg about six inches from the ground, and then tie the ends of the string.

As a good deal of furniture has a polished surface, and as these glittering patches yield spotty lights in the picture, we must always be on the watch to guard against them as far as possible. Very often a glittering light can be got rid of by moving the article an inch or two. Picture frames and their glasses are a great nuisance in this way. A wine cork or a handful of crushed-up newspaper placed between the frame and the wall will usually give it enough tilt to get rid of the glitter. Chimney pieces, ornaments, fire irons and all like things need watchful attention. Bear in mind that an object may show a bright reflecting surface when you see it from one position and not do so when viewed from some other position. Having got the view point fixed, unscrew the lens, throw back the focussing screen and look at the subject through the hole of the lens flange. It may happen that some of the reflections you have been troubling about do not appear from this point of view, while others previously unnoticed show themselves. This plan of direct inspection is better than trying to see and locate them from the ground-glass inverted picture. It is easier, quicker, and far more certain, but do not forget to view all the picture by putting the eye to all the four corners of the back opening of the camera.

We may take it as a good general rule that the farther we can get away from the subject the better proportions and perspective we shall get. It may not occur to everyone to view the subject from outside the room itself, *i.e.*, through the chink of a half-open door. But very often this gain of an extra foot or two makes a good deal of difference. In the case of a two-windowed room on the ground floor or on an outside balcony we may sometimes stand the camera outside one of the windows.

A lens of moderately short focus is generally necessary for this kind of work, but it is quite a mistake to go to extremes. A good general guide is such cases is to have the focal length of the lens intermediate between the length and breadth of the plate. Thus for a quarter-plate the focal length may be between 3½ and 4½

inches, preferably nearer four than three inches. We often notice in small interiors an up-hill look about the floor. This is due to the use of the lens too high up above floor level. If the tripod has not got sliding legs to bring the camera to about three or three and a half feet from the ground, then a small table can be used as a camera stand. Sometimes the camera can be put on a bookcase, shelf, or mantelpiece, and so get the lens farther away from the object than it would be if a tripod be used.

As to exposure and development the best plan is to follow the well-proved rule of exposing for the shadow and developing for the high lights. Most interior negatives are under-exposed. This probably results from the necessary employment of a small stop to get the required details, and again the eye does not adequately realise the strong light and shade contrasts in most cases. In rooms with small windows, if the walls are not already of a light colour it will be found very advantageous to fix up a white sheet or tablecloth on the wall opposite the window (and, of course, out of the view). This acts as a reflector and diffuser and saves the dark corners from becoming as detailless clear glass in the negative.

Most interior negatives are over developed, and this tends to accentuate further the contrasts which under-exposure has already emphasised. The best kind of developer for interior work is one which brings out all the image quickly and then builds up density contrasts gradually. For this purpose Azol and similar developers freely diluted are to be preferred. When in doubt it is better to over rather than to under expose, as prolonged development will generally give enough contrasts unless the exposure has been very much over done. Similarly it is better to under rather than over develop, because intensification will easily give us added contrasts; but it is not an easy matter to reduce without losing some of the shadow detail and lower tones, or alter the gradation. In all kinds of interior work the shadows are nearly always far more important than the high lights, and special attention should at all times be given to them.

THEORY AND PRACTICE OF DEPTH OF FOCUS.

IV

[If objects at, say, 6 ft. and 20 ft. from the lens are required equally sharp in the negative, on what distance should one focus? The formula for problems of this kind is shown in the present chapter, in which also are given formulæ for ascertaining the diameter of a stop or the nominal F. No., which requires to be used in such circumstances, in order that the degree of unsharpness of the images of objects at the prescribed distances shall not exceed a given value. An allied question is the devising of a series of distances, which may be marked on the focussing scale of a hand-camera, such that (by focussing on any one of them) far depth extends to the next greater and near depth to the next smaller.]

The Distance to Focus On.

A PROBLEM of occasional occurrence is: on what intermediate point shall one focus in order that a nearer and a more distant object shall be rendered in the same degree of unsharpness, so that the best distribution of focus shall be thereby obtained in the negative?

Fig. 7 again represents the construction in the image space which yields the formula for the required distance on which to focus. As

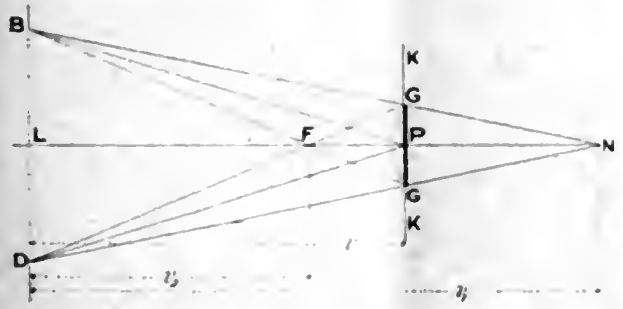


Fig. 7.—Illustrating images F and N of furthest and nearest objects to which depth extends when focussing on a given object. P is the point of the object in sharp focus. F is the image of the further object and N of the nearer, the cross-section of pencils from each being $G\,G = c$ in the plane of the focussing screen $K\,K$.

before, $B\,D$ represents the diaphragm and $L\,F$ the lens axis. N is the focus of rays from the nearer object at a distance u_1, and F that of the further object at the distance u_2. It is clear that the plane $K\,K$ in which the pencils of rays from u_1 and u_2 have the same cross-section is the focus of the distance required. This distance u can be expressed simply in terms of the distances u_1 and u_2.

From the triangles $B\,F\,D$ and $G\,F\,G$,

$$\frac{L\,F}{F\,P} = \frac{B\,D}{G\,G}$$

But $F\,P = L\,P - L\,F = v - v_2$.

Therefore $$\frac{v_2}{v - v_2} = \frac{B\,D}{G\,G}$$

Similarly from the triangles $B\,N\,D$ and $G\,N\,G$

$$\frac{L\,N}{P\,N} = \frac{B\,D}{G\,G}$$

But $P\,N = L\,N - L\,P = v_1 - v$.

Therefore $$\frac{v_1}{v_1 - v} = \frac{B\,D}{G\,G}$$

Therefore $$\frac{v_1}{v_1 - v} = \frac{v_2}{v - v_2}$$

whence $$v = \frac{2v_1 v_2}{v_1 + v_2} \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (a)$$

The three image distances, v, v_1 and v_2, are respectively equal to:—

$$v = \frac{fu}{u - f} \qquad v_1 = \frac{fu_1}{u_1 - f} \qquad v_2 = \frac{fu_2}{u_2 - f}$$

Substituting these values of v, v_1 and v_2 in equation (a) we get:—

$$u = \frac{2u_1 u_2}{u_1 + u_2} \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (15)$$

In words, *the intermediate distance upon which to focus in order to obtain an equal degree of unsharpness in the images of a nearer and more distant object is equal to twice the product of the two given distances divided by their sum.*

For example, objects at 80 in. and 240 in. are required equally defined. Distance on which to focus is therefore:

$$\frac{2 \cdot 80 \cdot 240}{80 + 240} = \frac{80 \times 240}{320} = 120 \text{ in.} = 10 \text{ ft.}$$

It is clear that formula (15) is independent of the focal length of the lens, the size of the diaphragm, or the standard adopted for the disc of confusion. The formula is strictly limited to giving the distance on which to focus for an equal degree of unsharpness in the images of objects at the specified distances. If the degree of unsharpness is too great to be permissible, the use of a smaller stop will reduce it equally as regards the image of both the nearer and more distant objects.

The stop which is necessary in order to obtain a disc of confusion corresponding with any chosen value of c for the images of objects at u_1 and u_2 when focussing on u can now be found from a modification of formula (7) or (9).

Stop required for required near or far extension of depth when focussing on a given distance.

As is evident from its form, formula (15) gives only the distance u on which to focus in order that the best distribution of "focus" may be obtained between a nearer object u_1 and a further object u_2. It does not tell the stop which requires to be used in order that the disc of confusion at u_1 and u_2 shall not exceed a given value.

The actual diameter of stop or, alternatively, the F. No. can, however

be found by suitable transformation of either formula (7) for the near distance to which depth extends or formula (9) for the far distance.

From formula (7), if we focus on an object at a distance u with a lens of focal length f, and diaphragm d, and adopt a disc of confusion of diameter c, depth extends to a distance u_1 from the diaphragm, eqnal to:

$$\frac{fdu}{fd + c(u - f)} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (7)$$

In the case that we know both u and u_1 (the former having been found from formula 15), formula (7) can be written so as to give the value of d in terms of these distances, and of f and c. Converted in this way, formula (7) becomes:

$$d = \frac{cu_1(u - f)}{f(u - u_1)} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (16)$$

In words, *to find the actual diaphragm diameter required for "focus" up to a certain near distance u_1 when focussing on a distance u, subtract one focal length from the distance u, multiply by the distance u_1 and by the diameter of the admitted disc of confusion. Divide the result by the local length of the lens, and also by the difference between u and u_1.*

If the disc of confusion be taken as 1-200th of an inch, the above formula becomes:

$$d = \frac{u_1(u - f)}{200f(u - u_1)} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (16a)$$

The formula may also be written so as to yield the *F. N°* (nominal f/d) which requires to be used under the same conditions:

$$F.\ N^\circ \text{ (i.e. } \frac{f}{d}) = \frac{200f^2(u - u_1)}{u_1(u - f)} \quad . \quad . \quad . \quad . \quad (16b)$$

In words, *multiply the focal length by itself, by 200 and by the difference between u and u_1 and divide the result by u_1 and by u less one focal length.* This formula gives the correct *nominal F. N°* (f/d not v/d) to which the lens must be set to secure the required degree of sharpness. The exact number so obtained is not likely to be marked on the lens unless a very finely sub-divided scale has been specially engraved for the purpose. In practice, the lens will advantageously be stopped down to the nearest smaller stop, or higher *F. N°* marked on its mount; or, if shortness of exposure is a consideration, a special diaphragm may be cut to the size indicated by formula (16) or (16*a*).

These formulæ in all three forms apply to objects at any distance, but as a rule they are of service only in calculations relating to the making of relatively large scale photographs of near objects, in which circumstances considerable sharpness is required. For this reason a disc of confusion of 1-200th of an inch has been chosen for (16*a*) and (16*b*).

For smaller values of u, i.e., when the object is near the lens, the effective or exposure value of the stop so determined will be reduced in consequence of the increase in the camera extension v or distance between lens and plate. (The time of exposure with a stop of any given diameter is of course directly proportional to the square of the camera extension, or varies directly with the area of the surface over which the light entering the lens from the objects is spread on the plate.) It is useful, therefore, to know the effective value of the stop for exposure purposes, and this may be found by multiplying the *nominal F. N°* by $\frac{u}{u - f}$, or by $r + 1$, where r is the ratio of negative to object, i.e.:

$$\text{Effective } F.\ N^\circ = F.\ N^\circ \times \frac{u}{u - f}, \text{ or } = F.\ N^\circ \times (r + 1)$$

For example, an object is to be photographed natural size, and the *F. N°* to which the lens must be set has been found by formula to be *f*/22. Here r, or ratio of negative to object = 1. Therefore the effective exposure value of *f*/22 will be 22×(1+1) or 44. Exposure must be given as if the stop in use were *f*/44, and the time required will be four times that which would be sufficient when taking a distant object with the same stop.

Again, an object 20 in. distant is to be taken with a 6 in. lens, working at *f*/16. The effective *F. N°* of the stop will then be $16 \times \frac{20}{20 - 6}$, or nearly 23, and the exposure will be more than double that normally required with *f*/16.

The above formulæ for the diaphragm may equally be expressed in terms of the far distance u_2 obtained in "focus" when focussing sharply on a distance u_1 in which case they are:—

$$d = \frac{cu_2(u - f)}{f(u_2 - u)} \quad . \quad . \quad . \quad . \quad (17)$$

$$d = \frac{u_2(u - f)}{200f(u_2 - u)} \quad . \quad . \quad . \quad . \quad (17a)$$

$$F.\ N^\circ \text{ (i.e. } \frac{f}{d}) = \frac{200f_2(u_2 - u)}{u_2(u - f)} \quad . \quad . \quad (17b)$$

When considerable magnification of the object is required the total depth distance ($u_2 - u_1$) obtainable in sharp focus will be small, as the *F. N°* calculated from the formulæ rapidly becomes impossibly high, or, in other words, the stop diameter required soon passes the limit of practicable smallness.

Diaphragm for Near and Far Depth Distances in Terms of Variable Disc of Confusion.

It remains to derive the formula for the diaphragm required for depth distances of u_1 and u_2, when focussing on u, from the standpoint that the diameter of the disc of confusion may be a certain small fraction, e.g., 1-2,000th, of the viewing distance. In formula (16), viz.:

$$d = \frac{cu_1(u - f)}{f(u - u_1)},$$

let us replace c by an expression representing 1-2,000th of the image distance (which should be the viewing distance) of an object at a distance u. The corresponding image distance, from the law of conjugate focal distances, is

$$\frac{fu}{u - f}$$

so that we will take c as $\frac{fu}{2{,}000\ (u - f)}$.

Substituting this value of c in formula (16), we get

$$d = \frac{u}{2{,}000} \times \frac{u_1}{u - u_1} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (a)$$

From formula (15),

$$u = \frac{2u_1u_2}{u_1 + u_2}$$

Substituting this value of u in the latter part of (*a*), we get

$$d = \frac{u}{2{,}000} \times \frac{u_2 + u_1}{u_2 - u_1} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (18)$$

That is to say, from the standpoint that the admissible disc of confusion is a small fraction of the viewing distance, the actual diameter of diaphragm required for limiting the unsharpness of objects at distances u_1 and u_2 when focussing on u is found by multiplying the sum of u_2 and u_1 by u and dividing the result by the difference between u_2 and u_1 and by 2,000 (assuming 1-2,000th as the angle of sharpness of vision).

Consecutive Depth of Field.

A question of some practical importance is:—Can there be devised a series of distances u_1, u_2, u_3, u_4 from the camera such that, if sharp focus be obtained on any one of them, depth extends forwards to the next greater and backwards to the next smaller? For example, if u_1 is the smallest and u_4 the greatest of the four distances, can we devise them so that when focussing on u_2, far depth extends to u_3 and near depth to u_1; and when focussing on u_3 far depth extends to u_4 and near depth to u_2?

It can easily be shown, both by geometrical construction and by formulæ (8) and (10), that the above requirement cannot be fulfilled *exactly* by any series of distances. It was, however, pointed out by C. Welborne Piper ("Amateur Photographer," Vol. 26, Sept. 27th, 1897, p. 252) that a certain series of distances possesses the above property with quite sufficient approach to exactness for practical purposes. This series (in the inverse order of magnitude) is: the hyperfocal distance; half the hyperfocal distance, one-third the hyperfocal distance, and so on; which may be written as

$$\frac{H}{1} \quad \frac{H}{2} \quad \frac{H}{3} \quad \frac{H}{4} \quad \frac{H}{5} \quad \frac{H}{6}$$

Actually the distances are not limited to this particular series. They may be any distances obtained by successively dividing the hyperfocal distance by numbers in arithmetical progression, that is to say, numbers differing from each other by the same amount. In the above series the common difference of the divisors is 1, but it could be any other number. The above series, however, provides about the most useful series of distances. For example, with a 6-inch *f*/8 lens (hyperfocal distance, 38 ft. for disc of confusion of 1-100th of an inch) the distances are approximately:—

38 ft., 19 ft., 13 ft., 9 ft. 6 in., 8 ft., 6 ft., 5 ft.

Thus, when focussing on 19 ft. with *f*/8 depth extends from 38 ft. to 13 ft., when focussing on 13 ft., it extends from 19 ft. to 9 ft. 6 in.

The degree to which the depths of field are approximate can be demonstrated by making use of formulæ (8) and (10). If for u in these formulæ we write $H/2$ it will be found for example that the nearest and furthest distances of depth differ very slightly from $H/3$ and H, respectively. A still simpler device is to replace u in these formulæ by $H + f$, $\frac{H}{2} + \frac{f}{2}$, etc., and by $H - f$, $\frac{H}{2} - \frac{f}{2}$, etc., when the following results are obtained. (Table III.)

TABLE III.

Furthest distance from camera to which depth extends.	Focus on	Nearest distance from camera to which depth extends.
—	infinity } i.e. $\frac{H}{\infty}$	H
infinity . . .	$H + f$	$\frac{H}{2}$
	$H - f$	
H	$\frac{H}{2} + \frac{f}{2}$	$\frac{H}{3}$
	$\frac{H}{2} - \frac{f}{2}$	
$\frac{H}{2}$	$\frac{H}{3} + \frac{f}{3}$	$\frac{H}{4}$
	$\frac{H}{3} - \frac{f}{3}$	

It will be seen from this table, which represents mathematically and geometrically exact results, that in order to cause *far* depth to extend to the hyperfocal distance, we require to focus not on half this distance, but on half the hyperfocal distance *plus* half the focal length of the lens; and for *near* extension of depth to one-third the hyperfocal distance from the camera, the theoretical distance on which to focus is half the hyperfocal distance *less* half the focal length of the lens; and in like manner in the other cases. But in every case the odd focal length or fraction of a focal length is very small compared with H or $H/2$, etc., and may be neglected, so that the distances which are bracketed together in the table may be taken as H, $H/2$, $H/3$, and so on. The effect of such approximation is to give a certain amount of overlapping of the depth of field, a feature of the system which is an advantage from the practical standpoint.

Distances devised on the foregoing system have been recommended for the marking of the focussing scale of a hand camera. If this is done the graduations on the scale are equally separated by a space which, for a disc of confusion of 1-100th of an inch at the far and near depth distance, is equal to the $F.N$ of the full aperture divided by 100. The H mark (= 38 ft. in the above example) is made at this distance beyond the infinity mark. This rule again, while not theoretically exact, is sufficiently near to the truth for practice, under the ordinary conditions of focussing by visual judgment of distances. The degree to which the rule departs from truth may be seen by calculating the image distances of the object distances H, $H/2$, $H/3$, etc., and subtracting each from the next larger, the image distances corresponding with H, $H/2$, $H/3$, being $\frac{fd}{d-f}$, $\frac{fd}{d-2f}$, $\frac{fd}{d-3f}$, etc.

For example the space between the $H/4$ and $H/5$ mark for an 8-inch $f/8$ lens (H = 68 ft.) is .088 of an inch instead of .080 inch obtained by dividing the $F.N$ by 100. It is obvious that the size of the space between each mark is proportional to the $F.N$ of the lens. Hence, with lenses of aperture N smaller than about $f/8$, the graduations of such a consecutive scale are much too close together to be convenient. For this reason depth focussing scales have proved of little use in practice with modern large-aperture lenses.

E. E. B.

A COMPETITION for amateur photographers is being organised by the Southgate District Chemists' Association in aid of the Royal Northern and Passmore Edwards Hospitals. Photographs must be taken at a fête at Broomfield Park, Southgate, on Saturday, September 16. Rules, conditions and entry forms are obtainable from photographic dealers in Southgate. Mr. Gerald M. Bishop, managing director of Amalgamated Photographic Manufacturers, Ltd., will act as judge.

Photo-Mechanical Notes.

Half-tone Screens.

SOME time ago some notices appeared in the technical press respecting a new form of the half-tone process which, it was plain, very greatly simplified the working. It would seem that the basis of the method is the form of half-tone screen, particulars of which have now been published in a patent specification granted to J. A. H. Hatt, 22, East 89th Street, New York. The following is the chief part of this specification, No. 170,270.

One form of the invention is illustrated in the drawings, in which fig. 1 illustrates one element of the screen of fig. 3 and fig. 2 the corresponding other element of the screen of fig. 3, while fig. 3 represents the complete screen; fig. 4 is a section on the line 4-4, fig. 3.

In order to prepare this form of the improved screen, a number of glass plates are coated with a sensitized film, preferably a bichromated colloid. The coating is preferably of the type in which the sensitized film upon the glass, in so far as it is not acted upon by rays of light, shall be capable of ready removal therefrom. A regular cross line screen is then required, *i.e.*, a standard screen or a special screen such, for example, as the one which comprises two glass plates each ruled in such a way as to have clear glass strips of substantial width alternating with strips composed of a series of parallel closely spaced ruled lines, the two glass plates being superposed in such a way that the ruled lines cross each other at right angles. This screen is placed in front of one of the glass plates sensitized as described. A plain sheet of glass will usually be required between the screen and the sensitized glass plate in order to secure the proper "screen distance," which may be defined as the distance which produces a round dot on the sensitized plate through the rectangular, clear glass openings of the screen. After being placed in a printing frame, the plate is then exposed to an arc light. By varying the time of exposure this round dot may be made larger or smaller at will. The plate is now developed, for instance, by being immersed in water, and the round dot image which remains is dyed until it is quite black or opaque. The dyeing can be done by aniline dyes. The result of this treatment is illustrated in fig. 1, in which the glass plate 1 is coated with a series of spaced opaque dots 2. The space between the dots is not covered by a film but is clear glass.

This plate of fig. 1 is then used for the purpose of making the other half of the screen. The plate of fig. 1 is brought into contact with a second sensitized plate similar to the one from which fig. 1 was prepared and exposure made. The second plate is then developed in the same manner as the first, and it is also dyed, but to a different degree. The same dye that was used in making the first plate can be used in making the second plate, but the second plate must be left in the bath a shorter period of time or the dye bath must be diluted or a specially prepared dye bath may be used, the result being, in either case, to produce a translucent field 3 inter-spaced with clear glass openings 4, the latter corresponding in this particular method of producing the second plate to the position of the dots 2 of fig. 1. The feebly opaque part 3 of fig. 2 may be described as "translucent." The effect to be obtained is that the translucent portions 3 shall, to a certain extent, obstruct the free passage of light, but shall, nevertheless, when the light is intense, permit it, or a part of it, to pass through. The two plates, that is, the plates of fig. 1 and of fig. 2, are then placed together in such a manner that the clear glass 4 of fig. 2 and the opaque dots 2 of fig. 1 do not overlap, but are arranged, *e g*, in quincunx order. The result is shown illustratively in fig. 3, in which is illustrated a complete screen, which consists of three portions, first a general ground of translucent film 3, and upon

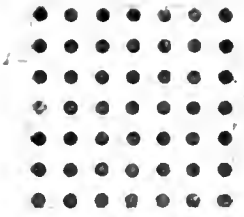


Fig. 1.

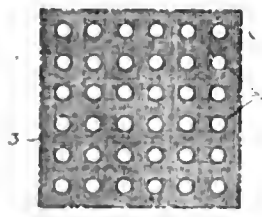


Fig. 2.

that ground interspaced throughout the entire surface of the screen a series of clear glass openings 4 and a series of opaque dots 2.

From the foregoing description it will be readily observed that instead of proceeding as described, master negatives for the production of these screens may be made by almost any photographic process. It must be observed, however, as already pointed out, that in order to make a satisfactorily working screen of proper optical qualities, it is essential that no film be allowed to remain over the clear glass portions of the screen, and that when a photographic process is used, it must be one which will leave no such film over the clear glass portions. The film, even if transparent, seems to diffuse the light and prevents it focussing properly, and, consequently, acts to prevent the formation of the "hard dot" which is required. In placing the two plates 1 and 2 in proper juxtaposition to form the complete screen of fig. 3, the two plates may be

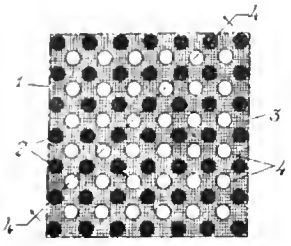


Fig. 3.

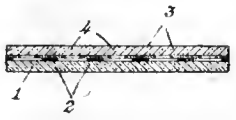


Fig. 4.

either placed directly together, as shown in fig 4, or they may be slightly spaced apart to form what is known as an "air space screen," the advantages of which are set forth in J. A. H. Hatt's Patent No. 14,393 of 1913. ("B.J.," 1914, March 13, p. 200).

In the employment of the screens it is preferred to use two plates, one of which (fig. 2) consists of a translucent film with small round clear glass openings interspaced there through. The clear glass openings of this plate occupy approximately the same positions as the rectangular clear glass openings in the regular or standard screens. The second plate (fig. 1), which is placed either in contact with the first-named plate or is placed in front of it with an air space between, consists of small, round, opaque dots of about the same size and number as the clear glass openings of the first-named plate, the remainder of the second plate being clear glass. These two plates are placed together in such a manner that the opaque dot will be located in the field of the translucent portion of the first plate, *e.g.*, in quincunx order (see figs. 3 and 4). The result is a screen consisting of clear glass round apertures surrounded by a field of very translucent colour the degree of translucency of which is controllable, and within that translucent field there will appear round, opaque dots.

On account of the controllability of the degree of translucency or opacity of the translucent field it is possible to obtain materially different effects dependent upon the controlled intermediate tint and without in any case affecting or modifying the clear apertures or the completely opaque dots. The resulting half-tones produced by the use of this new screen have the same texture as those made from the regular cross-line screens, the only difference being the perfect rendering of the tonal values. The use of the new screen involves no expert manipulations or special treatments, but the tonal values will almost automatically result from the fact that the clear glass spaces, being of the proper size and number, will permit the direct passage of light in so far as the same is desired, while the opaque dots prevent the passage of light to the extent desired, whereas the intermediate translucent part of the screen will, according to the intensity of the light or the length of exposure, cause just the right light values to be imparted to the sensitized surface in connection with which the screen is used.

PITTSBURG SALON OF PHOTOGRAPHY.—The tenth annual exhibition of the Pittsburg Salon of Photography, under the auspices of the Photographic Section of the American Academy of Science and Art, will be held in the galleries of the Carnegie Institute, Pittsburg, U.S.A., from March 2 to 31, 1923. Accepted pictures from abroad will be mounted by the committee, and all pictures will be hung unframed, under glass. The last day for entries is February 5, 1923. Particulars and entry forms may be obtained from Chas. K. Archer, 1412, Carnegie Building, Pittsburg, Pa.

FORTHCOMING EXHIBITIONS.

August 26 to September 9.—Toronto Camera Club. Secretary, J. H. Mackay, Toronto Camera Club, 2, Gould Street, Toronto, Canada.

September 9 to October 7.—London Salon of Photography. Particulars from the Hon. Secretary, London Salon of Photography, 5a, Pall Mall East, London, S.W.1.

September 11 to 15.—Professional Photographers' Association, Prince's Galleries, Piccadilly, London, W. (Trade and Professional). Hon. Secretary, Richard N. Speaight, 157, New Bond Street, London, W.1. Also foreign invitation loan exhibition of professional portraiture. Hon. Secretary, Marcus Adams, 43, Dover Street, London, W.1.

September 18 to October 28.—Royal Photographic Society Annual Exhibition. Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

October 18 to 21.—Rotherham Photographic Society. Latest date for entries October 4. Hon. Secretary, S. G. Liversidge, Orissa, Gerard Road, Rotherham.

October 18 to 28.—Portsmouth Camera Club. Latest dates: Entry forms, October 11; exhibits, October 16. Particulars from the Hon. Secretary, C. C. Davies, 25, Stubbington Avenue, North End, Portsmouth.

1923.

March 2 to 31.—Pittsburgh Salon of Photography. Latest date, February 5. Secretary, Charles K. Archer, 1,412, Carnegie Building, Pittsburgh, Pa., U.S.A.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, August 14 to 19:—

APPARATUS.—No. 22,632. Aparatus for use in treating with liquids, photographic papers, films or plates. P. Bamichas.

EXPOSURE METERS.—No. 22,190. Photographic exposure meters. C. Z. Case.

FINDER AND LEVEL.—No. 22,348. Combined finder and level for photographic hand cameras. Challenge Manufacturing Co., Ltd., and J. W. Listrum.

APPARATUS.—No. 22,559. Photographing, developing, etc., apparatus. J. Hazell.

WASHER.—No. 22,580. Apparatus for washing photographic prints, plates, etc. A. W. Judge.

FILMS.—No. 22,388. Photographic films. H. L. Lucoque, E. A. E. Pilgrim, and L. C. Rudkin.

DEVELOPERS.—No. 22,389. Photographic developing solutions. H. L. Lucoque, E. A. E. Pilgrim, and L. C. Rudkin.

POSITIVES DIRECT.—No. 22,390. Production of direct photographic positives. H. L. Lucoque, E. A. E. Pilgrim, and L. C. Rudkin.

SOUND PHOTOGRAPHS.—No. 22,062. Photographic sound recording. H. G. Matthews and R. H. Ruddock.

CINEMATOGRAPHY.—No. 22,199. Cinematographic apparatus. J. S. Pocovi.

CINEMATOGRAPHY.—No. 22,418. Cinematograph and optical projection apparatus. J. E. Thornton.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

ONE-EXPOSURE THREE-COLOUR CAMERAS.—No. 148,789. (July 10, 1920). The invention consists of a three-colour camera (which can also be used as a viewing instrument) producing three similar images on a single sensitive plate. There is an optical diaphragm, having an aperture common to three lenses and

corresponding in size to the normal opening of each lens. Two double-reflection prisms are fixed against the inner side of the diaphragm, one on each side of the axis of the latter, so that each prism covers part of the diaphragm aperture and leaves a space between the opposite edges of the prisms. The prisms can be adjusted relatively to the diaphragm aperture so that the part of this aperture which is covered by each may be regulated. The thickness of the glass plates between which the colour filter-films are mounted is so determined that the three images are in focus on the same plate.—Charles Emile Bredon, 44, Rue de Cambrai, Paris.

(Particulars of the construction of the apparatus are given on another page in the "Colour Photography" Supplement.)

Multicolour Screens.—No. 163,311 (May 12, 1921). This invention relates to a method of producing multicolour screens for use in photography, and its object is to avoid a decrease in brilliancy and clearness usually encountered in mordanting the dyes of a multicolour screen.

When an aqueous solution of tannic acid is mixed with an aqueous solution of a basic dye, these agents will precipitate each other. If, however, the water, as solvent, is partially substituted by alcohol, say methyl or ethyl alcohol, no precipitation will take place. Further, when a solution of tungstic acid, molybdic acid or phospho-tungstic acid is mixed with a solution of a basic dye, a precipitation will take place, but if the liquids are rendered basic, such as by the addition of a small quantity of ammonia, the mixing of the solutions will result in a limpid, coloured liquid without any precipitation.

According to the present invention, such limpid coloured liquids containing both a dye and a mordant, but in a form in which the agents do not precipitate each other, is now comminuted in any well-known manner, preferably by emulsifying. When the particles have been caused to adhere to the underlayer, they are dried. It is found that the dyes in the coloured tannin particles have been mordanted without precipitation. When certain other particles are used, such as coloured basic particles of tungstic acid, the mordanting is effected by a subsequent treatment, such as by an acid either in solution or in the form of vapour. If desired, the colour screen thus produced may be varnished, and then it is ready for use. Besides the dye or dyes and the mordant or mordants the particles also may contain inert substances, such as gum arabic, dextrin, albumin, etc.

In order to cause the particles produced by emulsifying coloured liquids with a suitable material, such as dammar varnish, to adhere to the underlayer, it is customary to furnish the underlayer with a cover or coating of basic character, such as gelatine with an admixture of borax, sodium silicate or the like. The particles which by the emulsification have been covered with a varnish substance showing an acid reaction will adhere to such an alkaline reacting underlayer. According to the invention, which has for one of its objects to provide a colour screen which is resistant against water and aqueous solutions, this alkaline coating is preferably substituted by another coating, which, as well as the particles themselves, is resistant against water. This purpose is attained by substituting for the gelatine coating or the like a coating consisting of or containing a basic cellulose derivative, which may be produced by applying to the surface to be coated collodion in which a small quantity of a soap, say sodium oleate, is dissolved. No claim is made to the provision of an underlayer having a coating of a cellulose derivative, as broadly new in itself, but the use of such coating with an addition of a basic substance as described.—Jens Herman Christensen, Sollerod, Holte, Denmark.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

Phodeko.—No. 425,944. Photographic chemicals and plates and sensitised films for photography. Cavendish's, Ltd., 87, Moorgate Street, London, E.C.2, manufacturers. May 9, 1922.

Phodeko.—No. 425,945. Photographic apparatus included in class 8. Cavendish's, Ltd., 87, Moorgate Street, London, E.C.2, manufacturers. May 9, 1922.

Phodeko.—No. 425,946. Photographs and photographic papers. Cavendish's, Ltd., 87, Moorgate Street, London, E.C.2, manufacturers. May 9, 1922.

Reprograph.—No. 427,133. Photographic apparatus included in class 8. Carl Janzer, 37, Hohenheimerstrasse, Stuttgart, Germany, engineer. June 16, 1922.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Monday, September 4.

Southampton C.C. "Table Top" Photography. J. W. Blay.

Tuesday, September 5.

Bournemouth Camera Club. Outing to Bourne Valley.
Hackney Phot. Soc. By River, Lake and Sea. Albert Hester.
Manchester Amateur Phot. Soc. Exhibition of the Originals of "Photograms of the Year."

Wednesday, September 6.

Rochdale Amateur P.S. "Carbro" Demonstration. E. Morley.

Thursday, September 7.

Royal Photographic Society. Methods of Enlarging. A. C. Banfield, F.R.P.S.

Saturday, September 9.

City of London and Cripplegate Phot. Soc. Outing to Mitcham.
Edinburgh Phot. Soc. Outing to Dalmahoy.
Hammersmith Hampshire House Phot. Soc. Outing to Hayes Common.
Sheffield Phot. Soc. Outing to Dronfield and Barlow Lees.
Southampton C.C. Outing: Around Southampton Docks.
Willesden Phot. Soc. Outing to Kensington Gardens.

CROYDON CAMERA CLUB.

At last Wednesday's meeting Mr. F. Ackroyd gave the concluding part of an informal and highly interesting chat on a tour abroad which included the Passion play at Oberammergau, Mr. J. C. B. Coffin following with an instructive lecture on "Vickers' Duralumin," the aluminium alloy.

Whilst being about the same weight as aluminium, Duralumin differs from it in several important respects. It has a far finer appearance, and takes an excellent dull, white, and polished finish. It can be machined and tapped like brass, does not rust, nor readily tarnish, even under adverse conditions, and last and by no means least, it has a strength of mild steel. When heated to a definite temperature Duralumin temporarily softens, regaining its original hardness in the course of a few days. This makes the production of difficult pressings possible, which afterwards regain full strength, quite a unique feature.

The strength of aluminium, he said, compares very unfavourably, and in order to obtain sufficient strength for the object in view so much metal has often to be employed as to save little or nothing in weight. He was surprised Duralumin was not more largely used in camera construction, having regard to the modern pronounced tendency towards lightness and portability, and the ease with which the alloy met these requirements combined with elegance and rigidity.

A Newman and Guardia folding reflex camera largely made of Duralumin was then passed round—a splendidly designed and constructed instrument which was examined with much interest by many covetous eyes. Certainly it costs good money, but Mr. Harpur, after close scrutiny, declared the camera to be dirt cheap at the price. A very ingenious and rigid "walking-stick" "N. and G." tripod made of the same metal also attracted much attention, as did the Duralumin skeleton frame and gear wheels of Messrs. Sinclair and Newman's well-known cinematograph camera. Photo frames, shutter cases, horseshoes as worn by Derby winners, and many other pressings and fitments were also shown.

In the discussion, Mr. Vivian Jobling said he could confirm the lecturer's high opinion of Duralumin. By substituting it for brass in hand cameras the selling value would be increased at but slight additional expense.

Commercial & Legal Intelligence.

LEGAL NOTES.—Notice is given of the dissolution, by mutual consent, of the partnership between Charles Henry Holmes and Herbert Holmes, carrying on business as wholesale photographic dealers at 41, Oxford Street, Manchester, under the style of Holmes Brothers. All debts due to and owing by the late firm will be received and paid by William Eaves, incorporated accountant, 15, Fountain Street, Manchester.

NOTICE is also given of the dissolution, by mutual consent, of the partnership between John Carter Collins, "Hazelrigg," 6, Hawthorn Gardens, Gateshead, Durham, and Willam James Moore, 17, Elliott Terrace, Newcastle-on-Tyne, carrying on business as photographers at 30, Green Street, South Shields, under the style of Collins & Moore. All debts due to and owing by the late firm will be received and paid by John Carter Collins, who will continue to carry on the business under the style of J. C. Collins.

NOTICE is given, pursuant to Section 242 (3) of the Companies (Consolidation) Act, 1908, that at the expiration of three months from August 25 the name of the Westbourne Studios, Ltd., will, unless cause is shown to the contrary, be struck off the Register of Joint Stock Companies, and the company will be dissolved

AT BANKRUPTCY BUILDINGS, Carey Street, W.C., on Wednesday, the adjourned general meeting of the creditors was held of John Robert Jeffs Pearson (trading as Albert Flint & Co.), photographer, described in the receiving order as of 68, Church Street, Camberwell, S.E., and residing at 1, West Avenue, Walthamstow, Essex, against whom a receiving order was made on December 18, 1911. This debtor has submitted a proposed scheme of arrangement under which all his creditors, with the exception of John Jeffs Pearson and Mary Jane Pearson, will receive a sum in cash, which with the dividend declared and already paid, will amount to 20s. in the £. The proposal provides for the release of the claims of John Jeffs Pearson and Mary Jane Pearson, which aggregate £417 10s. The scheme was agreed to by the requisite majority in number and value of the creditors' claims.

NEW COMPANIES.

PICTURESCOPE, LTD.—This private company was registered on August 14, with a capital of £1,000 in £1 shares. Objects: To carry on the business of inventors, designers, chemists, investigators, patentees, licensees, licensors or concessionaires, and to develop or exploit any invention or discovery connected with the graphic arts, printing, photogravure, collotype photography, kinematography, photographic and mechanical colour printing, sensitive photographic materials, optics, etc. The first directors are: J. E. Thornton, 14, Minster Road, W. Hampstead, N.W., manufacturer; W. L. Bayley, Morland Close, N.W.11, advertising agent. Qualification: £1. Secretary: J. N. Thornton. Registered office 4-10, Chenies Street, W.C.

PRINCESS YVONNE, NEWCASTLE, LTD.—This private company was registered on August 10, with a capital of £200 in £1 shares. Objects: To acquire the business of photographers carried on by Whinfield, Ltd., at 161, Northumberland Street, Newcastle-on-Tyne, and to enter into an agreement between T. Hall, of 37, Groat Market, Newcastle-on-Tyne, and Edith Plummer, photographer, of 24, Albion Place, Leeds. The subscribers (each with one share) are: Edith Osborne, 103, Whetstone Lane, Birkenhead, photographer; Edith Whitehead, 132, Falkner Street, Grove Street, Liverpool, photographer. Mrs. Edith Plummer, of 103, Bedford Street, South Liverpool, is the sole director for life. Secretary: Edith Osborne. Registered office: 161, Northumberland Street, Newcastle-on-Tyne.

DEFEATING THE PRESS PHOTOGRAPHER.—The "Daily Chronicle" tells the following story:—Having fought and overpowered a burglar who had invaded her home, a Daventry woman made short work of a Press photographer. Her feat brought her a visit from a Press representative, who asked permission to photograph her. The lady refused, and as the persistent photographer prepared to level his camera to take a picture of her house she produced a double-barrelled gun, and, levelling it at the camera man, threatened to shoot him unless he departed. Deeming discretion the better part of valour, the photographer postponed the taking of the picture to a more auspicious occasion.

News and Notes.

MESSRS. WELLINGTON & WARD, LTD., have sent us a novel form of advertisement. It consists of a letter asking four questions, and accompanying the letter is an attractive postcard for replies to the questions.

AERONAUTICAL PHOTOGRAPHS FROM THE GROUND.—The September issue of the "Scientific American" contains an article describing how aeronautical photographs may be taken from the ground. A triple gyroscopic balanced camera operated by electricity is used, the camera being carried to any desired elevation by a small pilot balloon. The camera takes twelve plates, and excellent results have been obtained at 3,000 feet.

PHOTOGRAPHS FOR THE GLASGOW EXHIBITION.—Schedules and entry forms are now ready for the photographic competitions arranged in connection with the Housing and Health Exhibition, promoted by the Corporation of Glasgow, to be held in the Kelvin Hall, Glasgow, during the three weeks commencing October 2 next. A sum of £150, along with a valuable challenge trophy, will be awarded in prizes. Special arrangements have been made for the display of all the competitive photographs under glass, thus affording them full protection during the period the Exhibition will run. There are three classes—open, beginners, and juveniles, and the judges are to be Mr. Archibald Cochrane, Mr. James McKissack, and Mr. F. J. Mortimer. Entries close on September 15, and the judging will take place on the 21st inst. Schedules and entry forms will be sent on application to Mr. C. P. Hainsworth, Kelvin Hall, Glasgow.

P.P.A. CONGRESS NOTE.—In addition to the items arranged in the preliminary programme of the P.P.A. Congress: Mr. Lang Sims, has arranged for a visit to the half-tone and colour illustrating departments of the Amalgamated Press, Ltd., by the kind invitation of General W. F. Mildren, C.B., C.M.G., D.S.O. Mr. Lang Sims will meet the members on the Surrey side of Blackfriars Bridge at 10.30 a.m., on Wednesday (September 13), and conduct them to the works. Tickets must be obtained from Mr. Alfred Ellis at the Princes Galleries, W.1. In order to facilitate the distribution of badges, tickets, etc., for the Congress members are requested to send their list of requirements (together with the amount) on the form supplied for this purpose to Mr. Alfred Ellis, 2, Vinery Villas, Hanover Gate, London, N.W.8, who will place them in an envelope ready for members on their arrival at the Princes Galleries during "Congress Week."

HISTORIC OPTICAL AND CINEMATOGRAPHIC APPARATUS AT SOUTH KENSINGTON.—On Saturday last there was opened in the scientific section of the South Kensington Museum an exhibition devoted to the history of the moving picture. This exhibition has been got together by Mr. Will Day (who has been collecting for more than twenty years), and contains more than 500 separate exhibits. It occupies nearly the whole of the Science Annexe, and is so arranged that it is possible easily to obtain a chronological survey of the industry. The cases are each named according to their contents. The first case of exhibits, for instance, is described as "Persistence of Vision," and contains the results of early experiments in this direction; the next is called "First Forms of Moving Pictures," and others "First Book Forms" and "First Lantern Forms." Eventually we arrive at the most elaborate and up-to-date projecting instruments. One of the exhibits is a book containing a picture of the magic lantern which Kircher invented in 1640, while another explains Dr. Roget's discovery of the persistence of vision on which the theory of the cinematograph is based. In the same case is Sir John Herschell's "thaumatrope," which was discovered nearly one hundred years ago. From these, through the "phenakistoscope" and the "stroboscope," developed the "zoetrope," which was patented by Desvignes in 1860. Other inventions followed, until finally in 1885 there was born the cinematograph as we know it—invented by Mr. W. Friese Green. A case is devoted to the work of Mr. Friese Green, and in it is a copy of his provisional specification for the invention, in which it is referred to as "a method of taking photographs in rapid series." The first commercial cinematograph is also shown—that perfected by Mr. R. W. Paul—which was used at the Alhambra in March, 1896. There are also the original lantern slides of the Coronation procession of George IV., a most interesting exhibition to which admission is free.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

A PHOTOGRAPHIC PROBLEM.

To the Editors.

Gentlemen,—May I place on record the peculiar result of an experiment which, for reasons that need not detain us, I was led to make a short time ago.

A slow "Ordinary" plate was laid on the darkroom bench with a penny on top of it, and given an exposure of about 1,000 C.M.S. It was then placed in a 0.2 per cent. solution of methylene blue B, and rocked for six hours, after which is was washed in running water for two days, all operations being conducted in *total* darkness. On bringing it into the light, a disc of undyed emulsion was visible where the metal had protected it from exposure.

The experiment was repeated, using other plates, namely, Royal Standard Lightning, Wellington Extra Speedy Press, Iso Speedy, and S.C.P. Lantern, Imperial Process and Lantern, but without effect. Rhodamone *B* and magenta 1a were without effect. Only methylene blue B and Wratten Ordinary plates gave any noticeable result.

The matter seems worthy of investigation, as it suggests a new field for development processes.

Perhaps you or your readers can relate a similar experience, or offer an explanation.—Yours faithfully,

KENNETH HICKMAN.

Imperial College of Science and Technology,
South Kensington, S.W.7.

PHOTOGRAPHS FOR BLOCK-MAKING.

To the Editors.

Gentlemen,—Your contributor D. Charles, in his article in last week's "B.J." on "Avoidance of Reflection Markings," says: "Blockmakers naturally encourage the employment of their 'art' departments, and so the worse the photographs supplied the more profit they make." Like most cynical remarks, I believe this aspersion to be untrue. I know the block-making business, and will assure him that more profit is made out of good copy than ever will be made out of bad. It is indeed obvious that when an artist has to guess what the details of an article are on a bad photograph he often guesses wrong; result, dissatisfaction and alterations demanding more costly time which, even if paid for at all, you may depend it will not be at a profitable rate.

One block-maker tells me he has spent over £100 in experiments in photographic polished goods free of reflection markings, and claims success for his perfected method. I wonder why he took the trouble if he could make more profit by photographing badly so as to keep his artist department busy?

The more Mr. Charles can teach us about taking good photographs for block-making the more pleased, I can assure him, block-makers will be.—Yours faithfully,

E. H. A

SYSTEM IN HALF-TONE OPERATING.

To the Editors.

Gentlemen,—In reply to Mr. Biermann's letter in the "B.J." of July 7, I can only hope that he will refer back to the article and satisfy himself that the discussion therein has been restricted throughout to pinhole conditions below, and up to, the normal distance. Mr. Biermann agrees that the diagram illustrating the passage "suggests that it is so." I should like to add that not only that particular diagram or passage, but the entire contents of the article, including the diagrams, would similarly "suggest" that the analysis does not extend to distances beyond the normal. If after this, and in spite of the footnote excepting in clear language all "cases where the screen distance is greater than the normal distance, for the stop used," Mr. Biermann continues to hold that "there is not a word about the screen distance being below the normal," I can only express my inability to see the point of his contention. Surely the author's reference to "the great majority of cases" in this connection can have no meaning at all unless it refers to cases within the scope of his discussion?

I shall not do Mr. Biermann the injustice of taking his statement that he "cannot find anything in practice that agrees with the geometrical projection" "in a strictly literal sense." Mr. Biermann must have his reasons for considering the screen distances suggested in the article as being "always too great," but in the absence of any definite data regarding his "missing factor" it may be allowed to stand where it is. My own experience of the ordinary cross-line screen has been limited to a much smaller range of screen rulings—for the finest screen that I have handled (175 lines) is of the 60 deg. type, and for coarse-grain work we invariably prefer to use a four-line screen. But within this limited range my experience definitely contradicts that of Mr. Biermann. Such divergence of experience can only be reconciled by a systematic comparison of notes.

As Mr. Biermann is "obviously anxious" to be fair, I ought to point out that this article is one of the very earliest of my father's writings on the subject, and it represents the beginnings rather than the conclusions of his researches. They are largely based on visual microscopic observations with comparatively coarse screens, an 85 line screen being, I believe, used for most of his earlier experiments. The opportunities for adequate observation on a commercial scale were at that time practically absent, for my father was a pioneer worker here in this field, and the printer's prejudice against the half tone block was almost overwhelming at that stage. These early articles may, therefore, appear to be incomplete, but they are perfectly consistent and logical, so far as they go. His teachings, I need not add, have been greatly amplified in his subsequent writings, which represent his maturer views and ideas on the subject.

My sole object in joining this correspondence was to suggest that the discussion be confined within definite and constructive limits. No one with any real knowledge of the conditions of half-tone work can be an exclusive advocate of this or that particular theory. If we try to trace out the light rays, travelling along their appointed straight paths from diaphragm to image plane, we get the inevitable pinhole image, and that phenomenon must be there, however much it may be masked by the superposition of other optical effects. It is, of course, well known that under certain conditions light rays do actually extend beyond their straight paths and interfere with each other. As such conditions are always present to some extent in half-tone practice, we are bound to find diffraction effects more or less in evidence. The same remarks would apply to the case of irradiation. I submit, however, that for our present purpose it is neither necessary nor desirable to go into the alleged claims of the rival theories until sufficient tangible data are available to make such discussions fruitful and profitable.

Looking beyond my own experience, I have noted some striking differences in the ideas and practices of half-tone workers in England as well as elsewhere. There are operators whose main concern seems to be the reduction of exposures, and they habitually use the largest permissible stops and correspondingly short screen distances, while others (mostly dry-plate workers) claim special advantages for small stops and long distances. Personally I hold that such different methods would show material differences in tone rendering at both ends of the scale. Then there are variations in the types of negative aimed at by different workers. Some dry-plate workers (and I am one of them) do not, as a rule, attempt to imitate the usual wet plate type of negatives, but deliberately prefer, in most cases, to have fairly substantial dots in the shadows, which are closed up during the printing on metal. The degree and character of the "opening up" which controls the size and shape of the high-light dots also present wide scope for variations. Again workers who are generous in their use of the square stop placed "diamond" fashion apparently obtain a certain vigour in the lower middle tones, which are unattainable by those who go to the other extreme of using elliptical and similar stops with openings extended in the direction of joining up.

We require definite quantitative information regarding the variations in tonal rendering given by such differences in practice. The only published work along such lines of which I am aware is that of Messrs. Bull, Smith and Turner, whose researches, I earnestly hope, are still being continued. I feel that fruitful research work would be greatly stimulated if workers who have adopted systematic methods of work would publish definite informations regarding their ex-

perience. Mr. Biermann has given us a concrete instance of this in detailing his relative standards of procedure in the cases of 50-line and 200-line screens. I am convinced that, even on this point, other workers, working along different lines, with different sensitive surfaces, and aiming perhaps at different types of negatives, will have significantly different experiences to relate.—Yours faithfully,

SUKUMAR RAY, B.Sc.

Calcutta, August 3, 1922.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

C. C.—The makers of the Sanderson camera are Messrs. Houghtons, Ltd., 88-89, Holborn, London, W.C.1.

B. T. H.—A reflex camera is very suitable for home portraiture, and an *f*/4.5 lens is almost indispensable. Practically all the cameras on the market are good value for their respective prices, and the make you mention is quite reliable if it is in good condition.

T. C.—You can try what a weak solution of ammonium sulphocyanide will do to take out the stains, a cause of which very often is the use of the hypo-ferricyanide reducer on a print which has not been completely washed from a fairly strong hypo-fixing bath.

L. R. S.—We do not know of such a lens. The effect you describe is usually obtained by tilting the copy considerably, and using an ordinary lens greatly stopped down for the sake of depth. In this way you can distort a flat original in one or other of its two dimensions.

R. G.—Many workers advise a good washleather for ridding the surface of a negative from superfluous moisture before putting it to dry. The washleather will mop up the maximum of moisture without leaving any particles on the gelatine surface. The leather should be one without stitches in it, and should be washed out in warm water, with a little washing soda dissolved in it before taking into use.

H. B. E.—In your particular case it is quite out of the question to use a 5-inch lens upon a half-plate reflex camera, as even if the lens could be sunk sufficiently, the mirror could not work. Few cameras of this size will work with less than an 8-inch lens, and many require a still longer focus. In any case, even with an ordinary camera, 5 inches is far too short a focal length for anything but wide-angle work

J. E. W.—We do not think that you will need any additional lamp for heads if you make the two following alterations:—Have your lamps made to lower so that they can be brought down to, say, 5 ft. 6 ins. for sitting figures. This will greatly shorten the exposure. Also bring the sitter nearer the light. This will give more vigour in the lighting. Substitute fine nainsook for the Japanese silk, which is far too thin; this will get rid of the four shadows.

S. R. G.—We cannot say. Some time ago Dr. C. E. K. Mees stated that measurements showed that, during the first eight or ten hours after exposure, a plate or film shows an increase in speed of about 15 per cent., the speed then remaining constant within the accuracy of measurement. The increase is rapid at first, the speed increasing about 10 per cent. in the first four hours. There is little change in the contrast, the change being entirely a shift of the inertia point of the curve.

F. J. C.—Postcards or prints, generally of the sketchy type, on double weight paper are best flattened by putting through the hot dry-mounting press, but the secret of making them remain flat is to first press face up (assuming the press is heated from above), then to remove from the press and at once lay face down on the still hot zinc plate. The print instantly begins to curl the reverse way, *i.e.*, the face becomes the convex side. If removed as soon as this tendency becomes evident, it will remain indefinitely in that flat condition. With a good size press, several prints can be done at once, and it takes less time than the ordinary dry-mounting.

C. P.—A formula for an acid fixing bath containing metabisulphite is :—

Hypo	4 ozs.	100 gms.
Potassium metabisulphite ...	200 grs.	13 gms.
Water to	20 ozs.	500 c.c.

A formula for a combined fixing and hardening bath is :—

Hypo	4 ozs.	200 gms.
Potassium metabisulphite ...	60 grs.	6.5 gms.
Chrome alum	240 grs.	25 gms.
Water to	20 ozs.	1 litre.

The hypo and metabisulphite should be dissolved in one-half of the water and the alum in the other. The two solutions should then be mixed.

C. P.—(1) The formula for the lead intensifier in the form you require it is :—

Lead nitrate	400 grs.
Potass. ferricyanide	600 grs.
Acetic acid	3 drachms.
Water to	20 ozs.

This stock solution will keep for a long time in the dark. The negative is bleached in it, washed once very carefully in 10 per cent. nitric acid—the acid makes the film very tender—then in water, and then darkened in :—.

A.—Sodium sulphide	1 oz.
Water	20 ozs.

(2) The plates work flat as the age increases.

S. H.—(1) We think for very dense negatives that the enclosed arc is to be preferred. This should be of the right-angled pattern, as in the small Westminster projection lamp. The great trouble of uneven burning is practically obviated by this model. With the vertical carbons the arc has a tendency to dodge round from front to back, so that two consecutive exposures may vary to the extent of 50 per cent. (2) It is impossible to give any limit, we sometimes use a 3-inch lens, with a 10½-inch condenser. For general work a 9-inch objective works well with an 8½-inch condenser, and if the half-plate is to be covered we should not care to use less than a 7-inch. (3) With a small source of light a ground-glass screen is almost essential. Not only does such a light show up scratches, retouching, etc., but there are few condensers of high enough quality to give an even disc with the naked light.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3253. Vol. LXIX. FRIDAY, SEPTEMBER 8, 1922. Price Fourpence.

Contents.

SUMMARY.

The Congress, which celebrates the coming of age of the Professional Photographers' Association, opens on Monday next at Princes Galleries, Piccadilly, London, W. (P. 529.)

A very full week of lectures, demonstrations, visits, and discussions has been arranged. The full programme of fixtures will be found on page 537.

At the annual general meeting of the P.P.A., to be held on Friday next, September 15, the report of the Council (p. 537) will be proposed, and the opportunity given for discussion of the work and policy of the Association.

In the present number of his series of articles on studio portraiture, Mr. J. Effel deals in a conversational style with the three-quarter length portrait. (P. 532.)

The quiet season, which is experienced at one time or another of the year in almost every business, may appropriately be the occasion for overhaul both in the commercial and technical department. (P. 530.)

In some notes on the D. & P. trade, "Thermit" expresses the opinion that businesses which are experiencing depression require to look more towards improvement or variation of the work which is supplied rather than to reduction in prices. (P. 536.)

In a contributed article, Mr. A. H. Hall gives his experience in the use of the Pinakryptol Green desensitiser in comparison with phenosafranine as regards the occurrence of stain and the use of the process for film. (P. 531.)

A further chapter of the series on depth of focus describes the ingenious optical conception of Dr. M. von Rohr, namely, the "plane focussed for," by means of which formulæ for depth of focus are rendered very much more simple, since they are based entirely on distances in the object space without reference to the focal length of the lens. (P. 534.)

The R.P.S. exhibition is to be opened, on September 16, by Mr. Solomon J. Solomon, R.A. (P. 542.)

A recent patent describes a focal-plane camera in which the picture is focussed up to almost the instant of exposure on the white blind of the focal-plane shutter. (P. 538.)

Occasional examples of fading of sepia-toned postcards are to be met with. (P. 529.)

Lantern slides from hard under-exposed negatives are often improved by use of one or other of the bleaching processes of toning. (P. 530.)

Further developments in the dye-toning of silver images have been patented by Mr. W. van Doren Kelley. (P. 539.)

For making a number of exposures on a single plate a mask of thin wood or stout card can be readily extemporised. (P. 530.)

EX CATHEDRA.

The Eve of the Congress. The diary of fixtures which appears on another page of this issue is a final reminder of the very great number of attractions which the Council of the Professional Photographers' Association has provided for the "coming-of-age" congress which opens on Monday next, September 11. It will be a crowded and strenuous week. From the hour of the official opening of the Congress Exhibition at noon on Monday to the advance private visit on the Saturday to the R.P.S. Exhibition, members of the P.P.A. will have little opportunity to rest, or go about other business, if they avail themselves of the full programme of lectures, discussions, demonstrations, and excursions which the Council has provided with a lavish hand. In the names of those who will lecture and will preside at the meetings they have the assurance beforehand that this year's Congress is an event in the history of the Association worthy of the occasion which it celebrates, and one in which every member will take part, whatever the sacrifice of time or business which may be required. It is not too much to say that the Congress represents a gathering of the forces in professional photography such as has never before been witnessed in England. Where all is of such technical or professional interest it is hardly fitting to lay emphasis on special items of the programme, but attention may be drawn to the inspiring presence at the Congress of Mr. Pirie Macdonald and of Mr. Aylett of Toronto, who will lecture on "Unusual Portraiture." The questions of fraternity among photographers of the relation of assistants to the P.P.A., and of the co-operative advertising of portrait photography are also subjects of pressing interest to photographers, from the discussion of which much good should come. We need say no more, except to congratulate the organisers of the Congress on the great work they have done and to wish all the members a profitable and enjoyable visit.

* * *

Faded Bromide Prints. Since the introduction of sulphide toning, an idea has become prevalent that, as sulphide of silver is a fairly stable compound, therefore toned bromides may be regarded as practically permanent. Although they are less liable to change than untoned prints, they cannot be regarded as invariably quite permanent. We have noticed a decided weakening in very carefully made prints after a year or two, and recently in inspecting a frame of sepia postcards the other day we saw several which, owing to condensation upon the covering glass, had faded in patches from a rich warm sepia to a sickly yellow. It may, of course, have been the case that other chemicals than those of the customary bleach and sulphide had been used. As far as our experience goes, prints toned in hypo-alum to a purplish brown or P.O.P. colour appear to be more

permanent than those toned to a warm brown. Some papers will not tone to a real sepia in a single bath. It would be an interesting and profitable field for experiment if the subject of sepia toning were investigated in respect to the permanence of the results.

* *

Toned Lantern Slides from Hard Negatives. Beginners with a hand-camera who may be dissatisfied with their first essays in lantern-slide making on account of the hardness of the transparencies from the often under-exposed negatives, may be well advised to make the use of the little known process of bleaching the slide. The process softens the gradation and at the same time produces an agreeable colour. One of the readiest bleaching solutions is made by dissolving 10 or 20 grs. of mercury bichloride in an ounce of water, but if this is objected to on account of its intensely poisonous properties, an alternative is one of potass bichromate, 10 grs., and hydrochloric acid, 5 drops, in the same quantity of water. The bleached slide is transferred to a weak bath of potass metabisulphite to remove the yellow stain, washed briefly, dried and exposed to daylight for a day or so, by which a warm brown tone is produced. By using 5 grs. of potass bromide and 5 drops of nitric acid in the above formula, instead of hydrochloric acid, a similar result is obtained, but of cool grey tone, whilst iodide in place of bromide in the modified formula yields a pleasant brown.

* * *

Multiple Exposures. It sometimes happens that a number of small negatives are required for passport or season ticket portraits or for small prints for advertising purposes. In such cases, to use even a quarter-plate for each is wasteful, not only of material but of labour, as every exposure has to be handled separately, both in development and printing. With very little trouble it is easy to make four exposures upon a half-plate in any studio camera provided with a repeating back. All that has to be done is to make a mask of thin wood or stout card to fit into the ordinary cabinet mask, having an opening the size of the desired exposure, placed centrally as regards width, but extending from one edge to the centre for length. Fresh marks must be made upon the dark slide, so that the plate will be accurately centred for each exposure. After two exposures have been made the mask is reversed and the second pair exposed. It is, of course, quite easy to extend this system to eight upon the half-plate with only one reversal of the mask. In order to avoid confusion with the existing notches for cabinets and cartes, it is a good plan to put the fresh markings on the lower runner of the repeating back, with a small non-projecting pointer on the frame of the slide.

* * *

Improvised Plate Carriers. It is sometimes convenient to be able to adapt without much labour smaller sizes of plates in ordinary dark slides in the absence of properly-made frames. The photographer who has a little mechanical skill in the use of tools can easily do this, using either wood or metal, but as a rule a good deal of time is needed, and on a journey the materials are not always to hand. For small sizes, say, 5 x 4 to half-plate or ¼ to 9 x 12 c.m., very good carriers may be made from stout card, the thickness chosen being nearly equal to that of the plate. This can usually be procured in the form of boxes from a draper or grocer. If the width of margin permits, the carrier may be made by cutting the outside of the card to fit the slide, with an opening the size of the plate. Across the corners pieces of wire are fixed for the plate to rest upon; hairpins answering excellently. If the card be white no apprehension need be felt; there is no more danger of reflection than if the full-sized plate were used. Another dodge is to cut out the opening and to insert the plate face down, then sticking one or more gummed luggage labels all over the frame and back of plate. This will answer with metal slides.

THE OFF-SEASON.

The photographer who has no dull time during the year might be thought to be in an enviable position, but whether this is so can only be proved by referring to his bank balance, for a man may work hard every day in the year and make little money, or he may have a short, busy season and make much. Anyway, most photographers do have a quiet time once or twice a year, and besides taking a holiday, which is usually well earned, the question is how to make the best use of the quiet time. In the first place, naturally, will come all arrears of routine work, if any exist, such as filing away negatives, overhauling stock, and generally turning out dark- and work-rooms. Next comes the question of repairs and renovations of apparatus and plant. In too many studios it is the custom to wait until a breakdown occurs before any notice is taken of the condition of the plant. This often happens at a time of pressure, when loss of time means loss of money or of prestige. An actual happening will illustrate this point. A sudden failure of a dry-mounting press revealed the fact that an essential part was worn out. It was found impracticable to procure a duplicate part from the makers, and an engineer took several days to make one to order. Meanwhile, there were two alternatives, to buy a new press or to send all prints to a trade house to be mounted. The expense of either of these courses could have been obviated if the defect had been remedied during a slack time. It is hardly necessary to mention the necessity for similar attention to studio apparatus, which certainly wants tuning up at least once a year.

Not only the technical, but the business side should be thoroughly overhauled. Every effort should be made to collect outstanding debts. In a well-managed business these should be few in number, but at any rate their amount is better placed in the passbook than in the ledger. If any new departure in book-keeping is to be made, such as the substitution of a card index system for the old books, now is a favourable time to prepare for the change, so that nothing will have to be done at the beginning of the new financial year.

Advertising schemes should receive attention, as there is no business too small not to benefit by advertising, while none is too large to be able to do without it. Folders should be drafted, circular letters composed, and prints and enlargements made and finished, not only for one display, but to allow of frequent change. If there are several employees on the staff, it is better to keep them busy in this way than to reduce their number in the slack season and to trust to picking up what help may be available when things begin to move. A contented staff, with a feeling of security of tenure, is one of the finest assets a business can possess, as they will usually be willing to work at high pressure when needed, if they know that a few weeks of slow business do not mean dismissal.

There is an old adage which says, "Never swop horses when you are crossing a stream." In other words, choose a suitable opportunity for making any important change. If a new departure of any sort is to be made, if

it be thought, for instance, that soft-focus work might be introduced with advantage, work the matter out carefully in the quiet time, and get a good range of specimens ready, instead of trying to squeeze it in at a rush time. Even a change of plates or paper is better made when there is ample leisure. If certain specimens give a favourable impression, it does not follow that similar results are to be produced at the first trial before the characteristics of the material are fully understood.

It is rather curious to consider the different ways in which the average man treats his business and his motor car or motor cycle. The one which gives him bread and butter is left to run on with little or no care as to its upkeep, beyond what is actually forced upon its owner, while the car, which is in most cases only a means of spending money, is nursed and cossetted and every new gadget procured for it, most being done in bad weather when the road is not inviting. Surely the moral is to take down the engine, decarbonise the cylinders, and adjust the bearings of the business as well as of the car.

SOME EXPERIMENTS WITH DESENSITIZERS.

In a recent number the advantages of Pinacryptol Green as a desensitizer were extolled, and therefore I have thought that the results of some practical experiments might be useful.

Half a gramme of this dye was dissolved in 8 ozs. of distilled water, making a solution of 1:500 with sufficient accuracy. A further dilution to ten times the volume makes the working solution. Thus 80 ozs. of solution is available at the cost of 2s. 8d. for the dye, which, in small quantities, is more expensive therefore than phenosafranine.

To test the staining properties, the emulsions which had given most trouble with Desensitol, *i.e.*, phenosafranine, were used, and a first test was made with Wellington double-coated anti-screen plates.

Four quarter-plates from the same box were taken, and after exposure two were placed for one minute in Desensitol, and two for the same period in Pinacryptol Green. All four were given a rinse in plain water, and were developed together in a whole-plate dish with pyro-soda, "B.J." formula, without bromide. The illumination was a Wratten OO safelight, which is a very bright yellow. There was no appreciable difference in the time of development, and the plates were fixed in the normal way with a hypo fixing bath made up with potass. metabisulphite. The two plates desensitized with Pinacryptol Green were free from visible stain as soon as they were fixed; the other two were badly stained. One of these, placed immediately under a tap, so that water in some volume ran directly over it and away, took 2½ hours in such favourable conditions before the stain appeared to be removed. Swabbing with cotton wool showed that the dye had not been completely eliminated, though the plate was clear for all practical purposes. The other was placed in a 12 in. × 10 in. dish, so that water flowed in at one corner and out at the corner diagonally opposite, the flow being sufficient completely to clear the water, which was dyed for the purpose, in about ten minutes. In such circumstances eight hours were required for the discharge of the dye. Of course, by the use of a fixing bath containing acetic acid or by the use of an alum bath after fixing, the time could have been much shortened.

Repetition of these tests, using D50 as a developer, did not give any material alteration.

The other material which has given the writer some trouble with Desensitol was film, both flat films and film packs. Similar experiments were tried with a film pack. Pinacryptol Green gave no stain; the pink stain with Desensitol was most persistent, and one film, which was probably in the solution for longer than the rest, was still appreciably stained after 36 hours' washing in running water and 3 days' soaking with occasional changes. It would seem, therefore, that in the cases mentioned some procedure other than plain washing is necessary. The writer has developed many films and double-coated plates after Desensitol, and has found that, to avoid staining as far as possible, it is necessary not to exceed the time of immersion of one minute, to give the film a couple of baths of plain water for a minute each before development, and to use a fixing bath with acetic acid (the Kodak acid fixing formula is successful). If necessary, an alum bath should also be used after fixing and partial washing, and from this stage hand washing, *i.e.*, having the films in water and frequently changing, is more effective than running water in any reasonable volume. It should be noted that both methylated spirit and formaline will help to discharge the dye, but if the procedure outlined above is followed there should be no need to use them.

Both dyes will become less effective with constant use, and it is advisable to filter through cotton wool at each time of pouring back into the bottle and not to be too particular to pour back the last dregs. Also the solution should be kept up to a constant volume by the addition of fresh from the stock bottle constantly. In this way the solutions can be used with safety and economy.

Ilford and Wratten panchromatic plates developed by candle light showed no difference, the pink stain of the Desensitol being readily discharged with ordinary washing, though the plates are always twice rinsed in water before development. For some unexplained reason the earlier batches of double-coated plates desensitized with Pinacryptol Green were not so clean as those developed at the same time, and treated with Desensitol, and the skies were rather badly marked with semi-transparent spots. It is not clear that the desensitizer had anything to do with this, but actually one of a pair of plates with the connecting film unbroken when taken out of the box showed this defect in the green dye, while the other did not in Desensitol. Both plates were exposed at the same time, and were taken straight out of the Mackenzie-Wishart envelopes for simultaneous development. Latterly, however, it has not been possible to repeat this trouble, which appeared more than once.

A trial was also made with bromide paper, which had one minute's immersion in the green dye, and was then developed within 3 ft. of a medium-sized inverted incandescent gas burner with success. Normal washing removed any stain. It is not thought that this use will have much application, though it might on occasions be useful for the demonstration of development of a bromide print before a number of persons.

The writer concludes that for all ordinary purposes Pinacryptol Green is less trouble to use, but the stain of Desensitol being readily removed by ordinary washing there is no real practical advantage. For films and double-coated plates the former has great advantages. It is interesting to note that Desensitol acts as an indicator of proper fixation; the double-coated plates take a very long time to fix, and once or twice they have been removed before fixation is finished. In such circumstances no amount of washing will remove the stain where the silver is not fixed out, but this part will assume a brownish appearance. On re-fixing the characteristic pink stain re-appears, and is then readily removed by washing.

A. H. Hall.

WITH A PORTRAITIST IN THE STUDIO.

[The previous papers of the present series have dealt with the bust portrait; the point of view; spacing and sizing. In the present chapter, the author, Mr. J. Effel, returns to the making of the three-quarter length portrait in his endeavours to bring studio practice intimately before those making a study of it.]

VI.—THE THREE-QUARTER LENGTH.

A THREE-QUARTER length photograph might be described as a bust with a body, arms and legs added on, and to call for extra skill. In a way this is the case, George, for I confess that I heave a sigh of relief when I know that an awkward sitter only wants a head and shoulders picture. But it really cuts both ways, for as I said to you when we took a bust portrait, one has to concentrate on the lighting and expression more than in a picture where there is a wider interest, so with the three-quarter figure the lighting and poise of the head may be somewhat subordinated to the general effect. Indeed, with portraits of ladies, compromise with the head and dress is frequently necessary. I bring up this point at the outset of our day's lesson for I want you to get the proposition right at the start. Obviously one cannot get one side of a lady's head and another side of her dress at the same time unless our subject is a contortionist; and the same remark applies to lighting. If it were merely grafting a little more on to a head and shoulder portrait, we could just start where we left off. But although the head *is* man's chief end (and woman's too) it is not the only consideration, or necessarily the premier consideration of the three-quarter length. The nature of each composition must determine the relative importance of the head to the complete scheme, but as with full lengths, the first consideration must be the general effect.

So far, George, we have had two models, and both men. There was nothing accidental or hap-hazard in my method. Quite three-fourths of our trade is with the fair sex, and I think the proper study for photographers should be women. I have carefully thought out the continuity of my course, and am attempting to proceed from the simple to the complex. It is because I think photographing women successfully calls for every ounce of artistic knowledge to be in waiting that I am leaving a full consideration of portraits of ladies till you have assembled more general guiding principles. Still, to introduce variety into our work I have asked Miss Miller to give us a few minutes this morning. We will think of her as a sitter wishing three-quarter length portraits.

Before our smart little typist puts in an appearance, I want you, George, to reflect upon what I said recently, that you should " pose " as little as possible. How is that consistent with my constant yapping about variety and novelty, and my insistence that the composition must be harmonious in detail as in mass effect? Frequently in art circles one hears the criticism that a painter is a clever " workman," and there is a slight disparagement behind the remark. It is implied that the craftsman has assimilated all practical knowledge of his art, that he has little to learn in the way of technique, but that there is a laboured look and a lack of spontaneity about his work. There is a hackneyed expression, "art that conceals art," and I can think of no better one to indicate what I am trying to get at. It is quite impossible for you to know too much of posing, of turning, tilting, and foreshortening head and limbs, and of the suitability of certain positions for certain types—but (and it is a very big " but ") if you merely regard the physical form of your client, and out of your empirical knowledge select a pose, and take the portrait accordingly, it is likely that the result will be a very good piece of work, *yet it may have artificiality stamped all over it.*

To cut it short, George, if you would be an artist in this business, you must know how to *make the sitters pose themselves.*

Now, just keep in mind what I have been saying, keep behind the camera all the time I am taking the first plate, focus and slip me the ball as smartly as possible. Well, why don't you get the camera approximately to the focus? You know it is to be a three-quarter length, and the last sitter was a baby on the floor! When you have a good idea of the style of picture you contemplate, don't for goodness' sake leave all the necessary mechanical camera operations until the sitter feels the position stale and becomes fidgetty. Scarcely a second should elapse between setting up the model to your satisfaction and the making of the exposure.

Ah, there you are, Miss Miller, we are just ready for you. No, no, don't take off your hat—at least, not yet. Oh, just keep your hand as you have it on the brim of your panama, only turn the wrist a little away; that's it, I get a side view of your hand now, and in addition we feature your wristlet watch. I would like you to stand over here a little, however; ah, that's right, that'll do splendidly. You've got your left hand splendidly placed, playing with those beads, but if you just extend the forefinger a—that's it, that's it. Now, Mabel, let your head incline a trifle more towards the hand on your hat. Did ever you hear the expression " the glad eye "? Good girl, I've got you. Yes, it's really done. I'm getting quite smart now that I have an energetic assistant to push me on. Now, run away and see that you do your hair very tricky, we want to do something special of you without your hat.

While Miss Miller is in the dressing-room, George, we will go over my procedure with that negative which has just been exposed. As you know, I have the entrance to the studio so cunningly contrived that the victims walk right into the line of fire. It is unnecessary to say " Stand down there, please," or " Would you mind taking a seat over in this corner?" Even with a sitter on whom you are prepared to use a few plates, the first one exposed is very frequently the best. Of course, I had our model of to-day weighed up long ago. Miss Miller is what sour faced people call a " flapper." Her pretty clothes, her high heeled shoes, her bracelets and beads are looked at askance by those who love neither beauty nor youth. The flapper has brought joy and colour into our lives, and certainly deserves well of the photographer. But let us photograph her to *look* like a flapper, not like a policeman at point duty. Miss Miller herself gave me a pose. I would naturally want to show all I could of her jumper, and as both hands are bejewelled, the rings and bracelets are put there to be seen, so we have to feature them well. What more simple than the one hand on the hat and the other (a totally different view of a hand) toying with her beads? When we were photographing Joe the other day I wouldn't let you shift him, but insisted that you move the camera instead. Why then did I ask Miss Miller to move? Just because she was standing on the wrong foot. Even though the picture is only a three-quarter length, the head tilted forward and the body resting on the " hind " leg would show unmistakably that the pose was just a pose, and that the photographer was fumbling ignorantly. Many of the present styles in women's dress are evidently designed to conceal the figure, and if we are not careful, very ugly results may occur. Study fashion plates and pictures of well-known beauties and you will see that the artists are all careful to make their models lean well forward, by this means getting the maximum of action and grace into the figure. If it cannot be said that a three-quarter length is merely a bust plus body and arms, certainly it can be termed a full length minus feet.

I made Miss Miller turn one hand slightly. Take a mental

note of this tip, George:—Photograph hands side face and feet front face if you wish to make them appear smaller. Sounds very funny, doesn't it? That's just why it ought to stick in your mind, and I make no extra charge for the memory course. Some day we will do nothing else but hands and feet, but meantime that will do to be going on with.

You saw me manœuvring the blinds. The lighting which would have done for an ordinary standing figure was too high for a broad-brimmed hat. An ugly shadow was just on the eyes (exactly what the hat is for, of course), so to avoid tilting the head up too much I let in a patch of low front light. A painter may get a wonderful effect with the eyes looking out of shadow, but I have never seen it done successfully in a photograph. You know the good old rule of exposing for the shadows. Carry it out to get the under part of the hat fully exposed, and the rest of your picture would lose its brilliancy. Whatever your scheme of lighting, be most particular about the eyes. One eye looking through a shadow has the effect in a photograph of making a great difference to the likeness.

I made rather a short exposure, and for two reasons. Firstly, I'd sooner have a little under-exposure and get a happy expression and a steady negative. Secondly, I want the picture to be bright and certainly not a fraction over-exposed. That's a point I haven't touched on yet, the influence of exposure on to the tonal quality of the composition. In our first lesson, I suggested that you might with advantage slightly exaggerate contrast in lighting to atone for the loss in brilliancy suffered by coloured objects represented in the drab medium of a photograph. We have now a concrete example of this necessity in the portrait of our typist. White panama hat, lemon-coloured jumper, crimson beads, and skirt of an uproarious check do not humbly ask to be rendered in low key. We frequently hear scathing remarks from fuzzographers about "soot and whitewash" productions. That's a grand expression, George, to hit off the picture lacking in half-tones, but, as Lord Bacon said, "there is a superstition in avoiding superstition," and a portrait in the "mist and mud-bath" style (invariably in folder of "art" paper) is the opposite extreme of the dud worker. Of two evils, the public will choose "soot and whitewash" every time, for greyness and over-exposure can only masquerade as "softness" to a photographer already in the soft and grey stage himself. Mental note, George:—Only accurate exposure can give you a negative faithfully rendering what you worked in the studio; under-exposure intensifies contrast; over-exposure does the reverse. The merest beginner may know that, but few old hands appreciate the full significance of the modifying effect on the scheme of lighting. Yet many exceptionally clever photographers habitually depart from what would ordinarily be the right exposure, and are amply justified by the results they produce. That, however, is a matter for the consideration of experts. I have no prejudice against soft-focus work, the use of under-exposure in getting rid of unnecessary detail, or any other departure from the straight path of text-book exactitude, but I believe most firmly that until the young student is strong enough on the technical side to produce straight negatives faithfully giving us what the eye saw in the studio, he is not strong enough to take liberties, and to attempt something startling in portraiture.

Let us now go back a little. I said the brim of Miss Miller's hat threw a heavy shadow on her brow and eyes. Well, to have exposed for that shadow would have lowered the tone of the hat, impaired the glow of the bright jumper, and given us, instead of a picture of the holiday girl, a negative that O. Henry might have described as "flat, stale, and unprintable." So I softened away the shadow—flappers don't like shadows—and exposed for the merry and bright.

Now here is our sitter again. Ah, bon jour, Suzanne. You know who Suzanne is, don't you, George? No? Well, you do surprise me. I begin to think it is you who are the old fossil, not me. I often wonder what you young fellows do with your time. A portrait photographer should be as up-to-date as a journalist. Miss Miller knows quite well what I mean, and is rather flattered that I take notice of her style in hairdressing. If you don't know anything about ladies' dress and fashions, George, you can never hope to score as a portrait maker for the fashionable set. Bring mo up the tennis racquet, my lad. Thanks, now show us the Lenglen leap, Mabel. Well, after all, we'll have to do something more subdued, we can't do moving pictures yet. Never, never get into the way of inflicting positions on sitters, or, as I ought to say to be accurate, get out of the bad habit. Make the punishment fit the crime, or, to be quite literal, suit the position to the age, the temperament, the dress, and the immediate mood of the client. That's rather a good idea of the great photographer of men, to find out for what purpose the picture was required, my only objection being that Mr. Macdonald says he *asks* the client. That's most reprehensible, and can only be excused by the fact that constant contact with the sterner sex has rather blunted the artist's finer perceptions. Think whether a certain position is meant to suggest movement or repose. Connect your accessories with the suggestion, and endeavour to express something with every picture. Upon my soul, I am beginning to have sympathy with that literary bore who writes long articles, every line of which begins with "Don't." Unfortunately there is so much to unlearn, that the don'ts are imperative to one who, like Hamlet, was born to set things right. Now, don't mix up the elements of movement with suggestions of repose. A girl in summery attire, with a tennis racquet, does not require a balustrade to prop her up. You can't take her actually in action, for that can only be done satisfactorily out of doors, but you certainly must do nothing that will detract from the suggestion of action. To get the right swinging movement into the body, watch the feet, of course. Yes, in those positions there is always more risk of the sitter moving, but a spoilt plate now and again is better than the Doan's backache portraiture. I think I can show you, however, how to reduce the risk of moves to a minimum. Always get the *extreme* of movement into your subject, with the feet properly placed. Do this yourself (when nobody is looking) in all the different placings of the feet, pressing rather too much where the weight is resting, and you will find that there is a kind of automatic lock steadying up the figure. With an incomplete movement, there is always uncertainty, and the danger of oscillation. One cannot go farther than the extreme.

Anything that keeps the hands well occupied is a great help in composition. Don't let both hands grasp the racquet or stick so that two sets of knuckles and fingers are featured as bunches of sausages or bananas. The beauty of a hand is, like the charm of Cleopatra, infinite variety. Regard the fingers as separate entities, and think of their interdependence. Don't laugh at my flowery language, George. I want you to get it rooted in your mind, just as I wish you to have a meaning for everything you do, that behind my funniosities there is always a serious lesson. One of my cleverest pupils once had a good joke at my expense. He took an elaborate picture of the message boy, and called it "The interdependence of the fingers." The joke lay in the fact that the boy's thumb was pressed to his nose. After all, it wasn't a bad illustration, and we may as well get a bit of fun out of our business as we go along. I want you, George, to make a practice of studying the work of advertisement and poster artists. There is a beautiful picture appearing just now on the hoardings, advertising a soap, a study of a young woman with a golf club. Spend a few minutes before that picture, George, and study the treatment of the hands.

Now, Miss Miller, you'll be getting weary of all this talk, we don't give a lecture with every client. Just hold the racquet as if you were resting from your exertions on the court. You see what I mean, George, about the hands. Comfort and beauty don't necessarily go together. Although Miss Miller is holding the racquet easy enough, it isn't right for

pictorial effect. Here's a thing I want to draw your attention to. Avoid angularity: the right arm there is too close to the body, and the loose-fitting sleeve runs into the figure giving a spurious stoutness which is seldom appreciated. Make the arm move from the shoulder, not from the elbow as if the upper part was paralysed. See what a difference that widening out has made, and how easily the hands have been altered. I have got a very diffused light on now, as you see, but I am not finished with the scheme. This is a great subject for a bit of jazz lighting. Just watch while I light up the hair, and cut out the figure a bit with the spot light. That's pretty good, I think; we'll expose it at that.

I seem to have done an extra amount of talking this morning, and I don't feel inclined to give you much more to ponder over. I was pleased to see that you have started a scrap book on the lines I suggested, and I can say that I was delighted to read your comments. You can't have too much material for this study work. A good plan is to collect the items as they appeal to you, sketches out of papers, illustrations of fashions, unmounted photo scraps, etc., and make the classification later. Some evening I'll take a heap of this stuff, and we'll go over it critically, and do some reconstructing. Thank you, Miss Miller, good morning, George.

J. Effel.

THEORY AND PRACTICE OF DEPTH OF FOCUS.

V.

[In the present chapter the student of depth of focus is introduced to the very ingenious optical conception of Dr. M. von Rohr, viz., the "plane focussed for," by which the formulæ for depth calculations are obtained in a much simpler form. Such formulæ are based on the view, which may be held in almost all cases, that the print is viewed under an angle of vision corresponding with that which prevailed in the taking of the negative. Before the chapters on the theory of depth of focus reach their conclusion acknowledgment should be made of the help rendered in their compilation by a contributor to the "British Journal," the Rev. H. C. Browne, of Dublin. We happened to mention to Mr. Browne that the present series of articles was in preparation and subsequently were exceedingly grateful for his reading of proofs and for a number of suggestions by which the subject was presented somewhat more exactly and clearly than would have been the case in the absence of his assistance.]

In the preceding chapters the question of depth has been treated chiefly from the standpoint of adopting a certain diameter of disc of confusion in prints without regard to their size, and thus with neglect of the phenomena of vision outlined in Chapter I. In accordance with this view, the formulæ relating to depth have been obtained from construction in the image space, that is between the lens and the focal plane.

But, as shown in Chapter I., there is reason for adopting a variable diameter of the disc of confusion, permitting the latter to be larger or smaller according to the greater or lesser distance from which the print

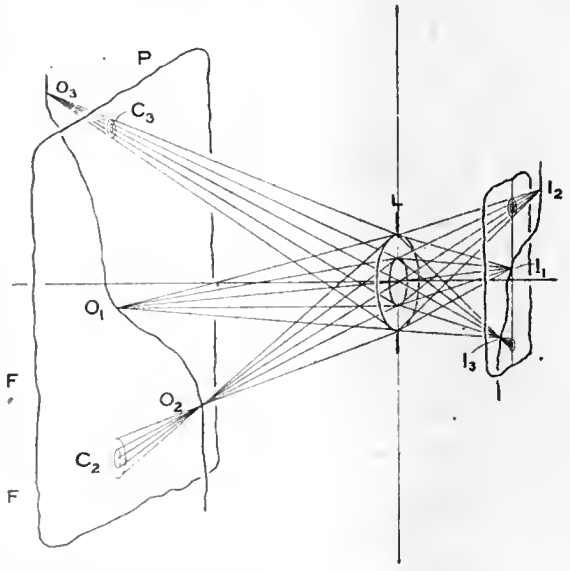


Fig. 8.—Illustrating the Von Rohr "plane focussed for." The image on the focussing screen is assumed to be projected on the imaginary plane, *P F F*, containing the part O_1 of the object which is in sharp focus.

or enlargement is viewed. This principle appears first to have been recognised by Mr. H. Dennis Taylor ("Photographic Quarterly," April, 1890, pp. 267–282) and was actively propagated by Mr. W. E. Debenham in the course of press controversies on depth of focus. But we owe to Dr. M. von Rohr [1] a most ingenious optical conception by which the consideration of depth (from the standpoint of a variable disc of confusion) is greatly simplified. The basis of this conception is the "plane focussed for" (Einstellungebene), the meaning and use of which must first be explained.

In fig. 8, let O_3, O_1, O_2 represent an object parts of which are at different distances from the lens *L*. The latter, so far as the transmission of image-forming pencils is concerned, may here be represented for simplicity by a single diaphragm of diameter *d* instead of by the pair of pupils (entrance and exit) necessary for the complete representation of its action. Suppose that the lens is focussed on the point O_1, a point image I_1 being formed on the focussing screen or plate. Plainly at this setting for focus the image of the nearer point, O_2, is formed at I_2 behind the focussing screen, and that of the further point O_3 at I_3 in front of the focussing screen. In other words, an aerial relief image is formed of the object extending in space on each side of the focussing screen. On the screen the points O_2 and O_3 are recorded as discs, which are the cross-sections, in the plane of the screen, of the pencils transmitted by the lens from these two points.

Let it be now imagined that we erect a semi-transparent screen passing through the point O_1 which was focussed and, like the focussing screen, placed perpendicularly to the lens axis. This, *P F F*, is von Rohr's "plane focussed for." Its purpose is to serve as a plane rendering of the solid (spatial) object and thus to permit of the out-of-focus phenomena being treated in the object instead of the image space. Fig. 8 illustrates approximately to scale its application in this manner. The image on the focussing screen is supposed to be projected on to the *P F F* so that the disc of confusion representing O_2 is obtained as the larger disc C_2 and that representing O_3 on the focussing screen as the disc C_3.

Plainly, the sizes of these imaginary discs in the *P F F* are determined by the scale of reproduction given by the lens according to its focal length and the distance of O_1 from the diaphragm. Hence if the disc of confusion (representing O_2 in the print) is imperceptible when viewing the print from the position of the diaphragm (which is the proper viewing distance for perspective rendering), the disc C_2 in the imaginary plane projection of the subject will also be imperceptible when viewed from the diaphragm. *Vice versa*, if these imaginary discs of confusion in the projection of the image on the *P F F* are imperceptible when viewed from the diaphragm, the reproductions of them in the print will be imperceptible when the print is examined at its correct viewing distance.

From fig. 8 it is clear that it is easy to obtain geometrically the diameters of the confusion discs (in the *P F F*) which correspond with an object point at any distance, simply by drawing the bounding rays of

[1] *Zur Geschichte und Theorie des Photographischen Teleobjectiv* (Weimar 1897); also *Eder's Jahrbuch* 1906, pp. 62–66.

the pencil (from the point) which pass through the diaphragm; producing them to meet the *P F F* in the case of nearer objects, *e.g.*, O_2. In this construction we have a simple means of providing the geometrical data for the application of the rules of sharpness of vision without requiring to know anything about the image or the focal length of the lens. The device of the *P F F*, so to speak, abolishes the image side of the optical system, so far as the derivation of depth rules and formulæ is concerned. Nevertheless the lack of accommodation of the eye in respect to viewing points which should be looked at nearer than 10 or 12 inches is a fact which cannot be ignored in depth computations according to the system now under consideration.

Before proceeding to show how these formulæ are derived, it must be pointed out that the present system does not reduce depth rules to such rigid forms that there is not the occasion for judgment as regards the permissible degree of definition. Far from it. Although it is no longer a question of choosing between a circle of confusion of say 1-100th or 1-250th of an inch, there is a precisely similar latitude offered as regards the value which shall be adopted for the angle of sharpness of vision. As already shown in Chapter I. an angle of 1′ (= 1-3438th) represents the most critical standard of definition, but it is generally considered that an angle of about 1′ 42″ (= 1-2000th) is sufficiently small; and even one of about 3′ 26″ (= 1-1000th) is regarded as not too large for much photographic work in which a critical standard of definition is not demanded. The use of these various values will be clear from what follows.

Hyperfocal Distance.

Hyperfocal distance has already been defined as the distance of the nearest object obtained in permissibly sharp "focus" when an object at an infinite distance is focussed sharply. In terms of the angle of sharpness of vision, this may be derived as shown in fig. 9. Here we

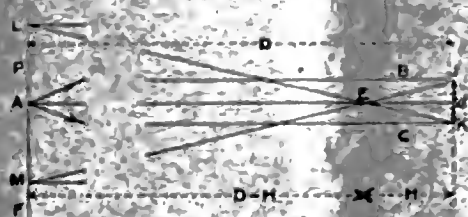


Fig. 9.—Illustrating formula for hyperfocal distance in terms of angle of sharpness of vision.

must be content with showing the assumed infinitely distant point *A* as at a very great distance *D* from the lens diaphragm of diameter *d*. The "plane focussed on" is thus *P F*. The parallel pencil of rays *B C* which passes through the diaphragm thus has its apex at *A*. If the distance from *E* to the diaphragm is taken as the hyperfocal distance (= *H*), the projection of the object point *E* on the *P F F* will be a disc of diameter *L M*. *L M E* and *K E J* are, therefore, similar triangles, whence

$$\frac{A E}{H} = \frac{L M}{J K}, \qquad \frac{H}{A E} = \frac{J K}{L M}.$$

Now $A E = D - H$, $J K = d$, and *L M*, in accordance with the facts of sharpness of vision, must be taken to be, say, 1-2000th of *D*.[1]

Hence $$\frac{H}{D-H} = \frac{d}{D/2000} = \frac{2000\,d}{D}$$

In this process we have assumed *D* to be a very great distance. The greater it is, the smaller is the difference between *D* and *D* − *H*. If *D* is infinitely great as required by our theorem, *D* − *H* becomes equal to *D*, so that *H* = 2000 *d*; that is to say, the hyperfocal distance is equal to 2,000 times the actual diameter of the lens diaphragm, adopting a value of 1-2000th (= .0005) for the angle of sharpness of vision. (Compare formula 4c in Chapter II.)

Distance of Sharp Focus when obtaining Infinity in "Focus."

In fig. 10 *P F F* is the "plane focussed on" at such at a distance *H* from the diaphragm that the projection on it of a point at infinity is of the permissible diameter. Obviously at any finite distance of the *P F F* the pencil from an infinitely distant point which just passes through the diaphragm is itself of the same diameter (*A B* = *d*) as the diaphragm. Hence, when adopting an angle of sharpness of vision of 1-2000, *H* is again equal to 2000 *d*, a formula which is in accordance with formula 5*b*.

Distance of Nearest "Focus" when obtaining Equal "Focus" at Infinity.

Fig. 10 likewise shows very plainly that when focussing on the hyperfocal distance the nearest point obtained in permissible "focus" is exactly half-way towards the lens.

For let *E* be a point on the lens axis such that the projection (on the *P F F*) of the pencil of rays which just passes through the diaphragm

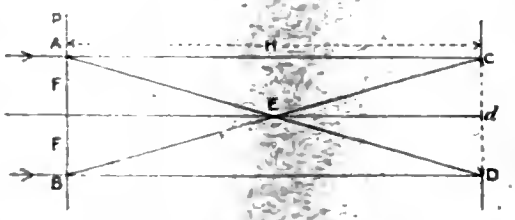


Fig. 10.—In terms of angle of sharpness of vision distance of sharp focus when obtaining infinity in "focus" is the same as the distance of the nearest object in "focus" when focussing on infinity.

is also *A B*. It is almost self-evident that *E* is at a distance *H*/2 (half the hyperfocal distance) from the diaphragm, *e.g.*, 1000 *d*.

It will be observed how very simple is the derivation of these formulæ in the object space compared with that in the image space already investigated in Chapter II.

It follows also that the stop (actual effective diameter) required for a given hyperfocal distance is calculated by dividing the distance by 2,000 or other denominator of the fraction representing the circular measure of the chosen angle of sharpness of vision.

Near and Far Distances to which Depth Extends when Focussing on a Given Distance.

The device of the "plane focussed for" likewise greatly simplifies the derivation of the formulæ for these distances.

In fig. 11, let *P F F* be the "plane focussed on" at a distance *u* from the lens diaphragm *B D* of diameter *d*.

Near Distance.

Let *N* be a point at the axial distance u_1 from the diaphragm. The projection of the image of *N* on to the *P F F* is, therefore, of the diameter *A C*.

From the figure

$$\frac{A C}{d} = \frac{N E}{G N} = \frac{u - u_1}{u_1}$$

Choosing an angle of sharpness of vision of 1-2000th, *A C* requires to be $\frac{u}{2000}$

Therefore $$\frac{u - u_1}{u_1} = \frac{u}{2000\,d}$$

whence $$u_1 = \frac{2000\,d\,u}{2000\,d + u}$$

In words, *the distance from the camera to which near depth extends when focussing on a distance* u *is* 2000 *times the diameter of the stop multiplied by the distance* u *and divided by the sum of* u *and* 2000 *times the stop diameter (for angle of sharpness of vision of* 1-2000).

Since 2000 *d* is the hyperfocal distance, the above formula becomes

$$u_1 = \frac{H \times u}{H + u}$$

corresponding with 8*a* obtained in Chapter III. by construction in the image space.

Far Distance.

Let *F* be a point at such a distance u_2 that the projection of its image on to the *P F F* is a disc of diameter equal to that of the projection of the image of *N*. Then from the figure

$$\frac{A C}{d} = \frac{u_2 - u}{u_2}$$

[1] In this and succeeding diagrams, it is obviously impossible to represent confusion discs in the *P F F*, and distances of the latter from the diaphragm on a scale correctly representing the very small angles of sharpness of vision. In fact, for the sake of clearness, the angles are deliberately exaggerated.

Again, taking $A\,C$ as equal to $\frac{u}{2000}$

$$\frac{u_2 - u}{u_2} = \frac{u}{2000\,d}$$

whence

$$u_2 = \frac{2000\,d\,u}{2000\,d - u}$$

or, writing H instead of $2000\,d$,

$$u_2 = \frac{H\,u}{H - u}$$

The Point to Focus on.

Fig. 11 may be used for the derivation of the formula of the distance on which to focus in order to obtain the best distribution of definition in front and behind the point focussed on.

Let F and N be points at the two distances which are required of equal definition. Draw the bounding rays $F\,B$ and $F\,D$ and $N\,B$ and

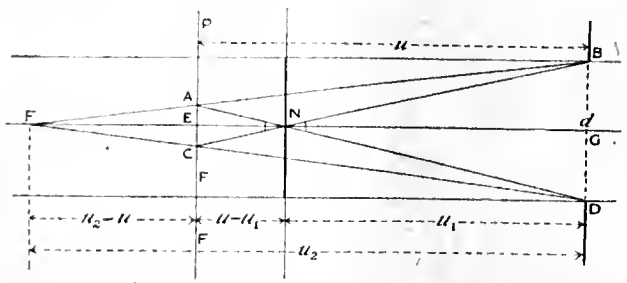


Fig. 11.—Illustrating formulæ (in terms of angle of sharpness of vision) for distances of near and far objects which are in "focus" when focussing on a given distance.

$N\,D$ of the pencils from each to the diaphragm and produce those from N to meet those from F in A and c. The distance $E\,G = u$ is then the required distance no matter what value is taken for the angle of sharpness of vision.

From the figure

$$\frac{A\,C}{d} = \frac{u_2 - u}{u_2}$$

and

$$\frac{A\,C}{d} = \frac{u - u_1}{u_1}$$

Therefore

$$\frac{u_2 - u}{u_2} = \frac{u - u_1}{u_1}$$

whence

$$u = \frac{2\,u_1\,u_2}{u_1 + u_2}$$

This formula is naturally identical with No. 15 in Chapter IV., since no standard of permissible unsharpness is involved.

G. E. B.

TECHNIQUE—AND THE D. & P. SLUMP.

"Slump" is not a nice word to use in connection with business, but unfortunately it is the most expressive word for a state of affairs which will persist in making periodical appearances. It expresses the present state of affairs in D. & P. as experienced by many dealers.

The fact that many tradesmen of diverse sorts have become "dealers" during recent years does not fully account for this slump, because they are not the only ones to suffer. At the same time, this dilution of the trade must have had its effect, but I do not consider that any professional man who undertakes D. & P. need worry about the opposition of cycle dealers and boot repairers, or blame such opposition for his declining business. The weather has certainly had a telling effect on this trade, but it has affected some more than others.

This unpleasant situation is being summed up by many dealers—by which term I mean bona-fide dealers, whether purely dealers, pharmacist dealers, or professional or trade photographer dealers—in a fatalistic mood, as a something which could not be foreseen, prevented, avoided or ameliorated. I foresee a number of firms dropping out of the line before next season, believing that it is played out. I foresee further price cutting, though enough of that has been done already. What I am not so sure about is a move to build something better out of this year's disappointment. It can be done. And the professional photographer should be the one to do it.

The slump is not entirely real. Some do not know there is one. I know dealers who have done better this year than ever before. And that in the face of three and four times their previous opposition. And in the same districts as others who know there is a slump. Again, some manufacturing firms have claimed that their immense D. & P. departments are not slack. If that is so, somebody must be doing the business. Why, then, are others thinking of giving up? I believe that it is merely a case of the survival of the fittest, though naturally there may be isolated cases which cannot be placed under this law. It sometimes happens that a well-organised and efficient business goes down before the opposition of a very dubious rival, but these cases are rare, and the general inference is that the successful shop knows or does something that the other does not.

When times are threatening, a certain type of business mind can think of only two things, namely, reduction of expenditure and reduction of charges. This has been the case with D. & P., and consequently there has been some very cheap-looking work about. But cheap-looking work does not appeal at these times. It may pass muster in the rush of a busy summer trade, and I have known poor stuff to be turned out and accepted in so many hours at seaside places. Cheap-looking work, however, is not acceptable even to the much-criticised British public at ordinary times, and it cannot build a reputation, even to the extent of one small repeat order.

What is the alternative to price-cutting and developing without charge? The alternative practised by the dealers I know who have not felt the slump is to keep up the prices and turn out better work. Also to keep a time table that was within possibility. As there have been no excessive record rushes of work following glorious week-ends (due to the absence of the glorious), it has been easy to keep things straight, but whereas the same cause has left many other dealers with nothing to do from about Wednesday to Monday, the successful ones have been kept going with repeat printing orders and enlarging.

Some have thought that the usual type of print turned out for amateurs was too stereotyped for alteration or improvement. But this is not so. There is perhaps nothing else in the whole craft which is so open to change. What is the usual thing? With a first-class dealer it is a thin gaslight print, of decent quality, though perhaps a trifle hard, fairly good as to quality of black, and masked with a clean narrow white border. With a good many others it is the same thing in a poorer quality and nondescript colour, unmasked or masked with a broken mask, and probably untrimmed. The surface in either case is semi-matt or glossy. Possibilities for change and improvement bristle all around this standard. Why gaslight? some may ask. On account of the great vigour which is necessary for amateur "negatives." But some firms make bromide paper that will cover the flattest negative that could remain outside the dustbin. Bromide saves light, and gives purer blacks with ease, though I do not wish to advocate any system of working in sepulchral shade. Extra contrasty bromides do not need semi-darkness, though they expose more rapidly than gaslights. Why thin paper? Have you ever seen a thin print which had lain in a client's pocket or wallet for a month or two? Mounted or card prints are worth any price in comparison. Why black and white? We don't like toning, admittedly, but it may be worth it. Why a white mask? I remember a time when midget portraits with similar masks were common. Then someone started black masking, and the system became popular.

I could go on with similar questions and answers, but I have gone far enough to express my ideas of the endless possibilities of a photographic line which, instead of being played out, is yet in its infancy. Someone will give their attention to this subject and secure the major portion of what trade there is, so that, slump or no slump, they will have something. There is every reason that this should be done by professionals. They have the knowledge and experience which is wanting with some of their opponents. Not so long ago many of them were looking none too pleasantly at the chemists and druggists for handling D. & P., though the latter have only acquired this trade by filling a public need when nobody else would bother. Now is the time for the professionals who are interested to make their claims for better and more profitable photography for amateurs and happy snapshotters.—THERMIT.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

Report of Council.

On Thursday, March 28, 1901, in the Chapter Room of Anderton's Hotel, Fleet Street, under the chairmanship of Thomas Bedding, was held the first meeting of professional photographers who afterwards formed the Professional Photographers' Association. The Council are pleased to report that several who were at that first meeting are still members, and take an active interest in the work of the P.P.A.

The President and Council offer to all concerned the heartiest congratulations on the P.P.A. having attained its twenty-first birthday, and in honour of the event have organised a Congress of professional photographers, which it is hoped will increase the fraternal goodwill between all sections of the profession and advance the interests of its members. The Council regret that for several reasons the Congress could not be held on the date of the annual general meeting; but, in order to give the members an opportunity of attending both, adjourned the latter until the last day of the Congress.

The Assistants' Evening is a new departure at the Congress, which it is hoped will meet with the approval of all; the Council are of opinion that on an occasion like the present the assistants should in some measure share in the advantages of the Association.

The incorporation of the Association is an important event which coincides with its coming of age, and the Council feel that under the guardianship of the Board of Trade the interests of the members will be fully safeguarded and its officers protected. The whole of the incorporation expenses have been paid, and thanks are due to Mr. Vaughan, the hon. solicitor, for his valuable assistance.

The balance-sheet and statement of accounts were presented at the first part of the annual general meeting, on March 10, and the financial progress since then is satisfactory.

The membership continues to increase; we have lost a few by death, resignation, or retiring from business and other causes. A small number have neglected to fill in their incorporation form, and therefore cannot be counted as members until they do so.

At the invitation of the Master Photographers' Association of Lancashire, Mr. A. Swan Watson, the President, and the Secretary, attended the annual Conference at Blackpool, where they were most heartily welcomed and entertained; Mr. Lang Sims was invited earlier in the year to Manchester, and these visits have undoubtedly brought about a closer friendship with our country brethren. Honorary membership has been arranged with several kindred associations, and to any of their members visiting the Congress a very hearty welcome will be extended.

The Propaganda Committee have done good work in making the Association known to photographers, and in producing "The Record," a journal which it is hoped will not only be an efficient means of communication between the Council and its members, but of sufficient interest to induce every professional photographer to join the Association.

The question of electric current at power rate is still receiving the attention of the Council, and the recent legal action, lost by a photographer who was not satisfied with the concession obtained by the P.P.A., serves to show that the Council were well advised to adopt peaceful persuasion instead of litigation.

Several cases of copyright have been satisfactorily settled without legal proceedings, although the assistance of the hon. solicitor has been invoked on a few occasions.

Thanks to Mr. Gray, a member of the Council, an authoritative statement has been obtained through the Great Western Railway Company that the railway companies now agree that professional photographers can carry their apparatus as personal luggage up to 100 lbs. free when travelling third class.

The usefulness of the Association to its members is exemplified by the help and advice given on the following subjects:—Studio building; defective postcards; legal help to Irish member; rates of wages; Sunday trading; taking views for local paper; ownership of negatives; Press reproduction fees for country papers; County Court summons; photographers' advertisement; charges for outdoor work; defective dry plates; purchasing businesses; failure to supply goods; Income Tax; Rent Act; taking estate photographs for advertisements; goods damaged by rail; goods damaged by post; newspapers reproducing single portraits from groups; charges for work away from the studio, etc., etc.

The Council have to report the resignation of Mr. Lang Sims, as secretary, on the inauguration of the Incorporated Association, and the appointment of Mr. Alfred Ellis, who is devoting the whole of his time to the work of the Association. Mr. Alexander Corbett has been elected chairman of Council in place of Mr. Ellis.

The thanks of the Association are due to the Royal Photographic Society for the use of their house for the Council meetings, to the Editors of the "British Journal of Photography," "The Kodak Professional Photographer," "Houghton's Bulletin," "The Photographic Dealer," and the "Amateur Photographer" for publishing reports and notices of the work of the Association.

THE P.P.A. CONGRESS.

Next Week's Programme.

Headquarters.—Prince's Galleries, Piccadilly, a few yards from Piccadilly Circus, and nearly opposite the Royal Academy.

Monday, September 11.

11 a.m.—Informal opening for registration of members, etc.

12 (noon).—Official opening of the Exhibition by the Right Hon. the Earl of Carnarvon.

7 p.m.—Reception by the President and Council.

8 p.m.—Presidential Address by Mr. A. Swan Watson on "Some European Portrait Painters, and Some Teudencies in Modern Portraiture by Photography."

Tuesday, September 12.

10 a.m.—Visit to the National Gallery, Trafalgar Square. Members will be conducted round the galleries by Mr. Hubert Wellington, who will deliver a special lecture. Members will also visit the National Portrait Gallery. Ticket for these two visits, 1s.

1 p.m.—Luncheon at the Adelaide Galleries of Messrs. Gatti, 436, Strand, nearly opposite Charing Cross South-Eastern station. Ticket, 4s.

3.30 p.m.—Lectures by Mr. C. P. Crowther on "The Man Behind the Camera" and "The Making of Portraits."

8 p.m.—Lecture by Mr. Charles Aylett, of Toronto, on "Unusual Portraiture," including spot lighting and soft focus.

Wednesday, September 13.

9.30 a.m.—11.30 a.m.—Visits to London studios by previous arrangement with the Secretary.

10 a.m.—1 p.m.—Demonstrations of apparatus, etc., by manufacturers and dealers.

3 p.m.—Lectures by Mr. Herbert Lambert, of Bath, on "Should Brother Photographers be at Daggers Drawn?" and Mr. Frank Brown, on "Photographic Parasites."

8 p.m.—Lecture by Mr. Pirie Macdonald, of New York.

Thursday, September 14.

9.30 a.m.—Departure by char-a-banc from Prince's Galleries to Windsor.

11 a.m.—Visit to State Apartments and Grounds of Windsor Castle.

12 (noon).—Congress Group on the East Terrace will be photographed by Mr. W. B. Chaplin (J. Russell & Sons, Windsor).

12.45 p.m.—Luncheon at the Royal Albert Institute, Sheet Street, Windsor.

2 p.m.—Departure from landing stage, Barry Avenue, River Street, by "Empress of India," for Staines.

4 p.m.—Departure from Staines by char-a-banc, reaching London at 5.30.

Tickets for this excursion, price 15s. each, must be ordered from the Secretary not later than Monday evening, September 11.

6 p.m.—Assistants' evening. Reception by the President and Council.

8 p.m.—Address by Mr. George Hana on "Assistants as Associate Members."

9 p.m.—"A Talk on the Exhibition of Pictures," by Mr. Marcus Adams

Friday, September 15.

10.30 a.m.—12.30.—Visit, by invitation, to the Photographic Salon, 5a, Pall Mall East, a few steps westward from the National Gallery.

3 p.m.—Annual General Meeting.

4—4.30 p.m.—Discussion on Co-operative Advertising of Photographic Portraiture.

6.30 p.m.—Reception by the President and Mrs. Swan Watson.

7 p.m.—The Congress Dinner. Tickets, 10s. 6d. each, from the Secretary.

Saturday, September 16.

11 a.m.—Advance private view, by invitation, of the Exhibition of the Royal Photographic Society at 35, Russell Square, W.C.1, within a few steps of the north-east corner of the British Museum.

Where not otherwise stated, all meetings take place at the Headquarters, Prince's Galleries, Piccadilly.

The exhibition of portrait, pictorial and technical photography, and also that of the photographic trade, will be open daily to the public from 10 a.m. to 9 p.m., except on Monday, from 2 to 9 p.m. On Thursday the gallery will be open to the public from 10 a.m. to 5 p.m. Charge for admission, 1s.

FORTHCOMING EXHIBITIONS.

August 26 to September 9.—Toronto Camera Club. Secretary, J. H. Mackay, Toronto Camera Club, 2, Gould Street, Toronto, Canada.

September 9 to October 7.—London Salon of Photography. Particulars from the Hon. Secretary, London Salon of Photography, 5a, Pall Mall East, London, S.W.1.

September 11 to 15.—Professional Photographers' Association, Prince's Galleries, Piccadilly, London, W. (Trade and Professional). Hon. Secretary, Richard N. Speaight, 157, New Bond Street, London, W.1. Also foreign invitation loan exhibition of professional portraiture. Hon. Secretary, Marcus Adams, 43, Dover Street, London, W.1.

September 18 to October 28.—Royal Photographic Society Annual Exhibition. Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

October 18 to 21.—Rotherham Photographic Society. Latest date for entries October 4. Hon. Secretary, S. G. Liversidge, Orissa, Gerard Road, Rotherham.

October 18 to 28.—Portsmouth Camera Club. Latest dates: Entry forms, October 11; exhibits, October 16. Particulars from the Hon. Secretary, C. C. Davies, 25, Stubbington Avenue, North End, Portsmouth.

1923.

March 2 to 31.—Pittsburgh Salon of Photography. Latest date, February 5. Secretary, Charles K. Archer, 1,412, Carnegie Building, Pittsburgh, Pa., U.S.A.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, August 21 to 26.

PLATE-HOLDER.—No. 23,082. Photographic plate-holder. F. E. M. Lovell.

PRINTING FRAME.—No. 22,791. Photographic printing frame. L. Crayssac.

CINEMATOGRAPHY.—No. 22,711. Motion picture films. W. van D. Kelley.

STEREO CINEMATOGRAPHY.—No. 23,017. Production of stereo films for cinematograph projection. G. W. Cooper and Stereo Kinema Syndicate, Ltd.

RELIEF CINEMATOGRAPHY.—No. 23,169. Apparatus for producing cinematographic pictures with relief effect. C. Parolini.

COMPLETE SPECIFICATIONS ACCEPTED.

FOCUSSING FOCAL-PLANE CAMERAS.—No 183,492 (September 12, 1921). The invention relates to that type of camera in which the picture is received and focussed on the blind of the focal-plane shutter, which latter, during the focussing operation, is held in a position corresponding with that which the plate will afterwards occupy and is moved forward for the exposure of the plate. The invention consists in means for effecting the usual focussing operation, and the subsequent exposure. The invention is intended for cameras of the type in which a shutter is used to cover the plate, etc., nearly in the focal plane of the optical system, the lens being unobscured save perhaps for a removable cap. A reflex type of camera has been proposed wherein means were provided for bringing the reflecting surface (which was a focal plane shutter) into view, and compensating for error due to the displacement of the focal plane during focussing, the means being interconnected with the shutter release mechanism so as to give a readjustment simultaneously with the shutter-release. The invention it is claimed allows the focussing of the view to be carried out more accurately than heretofore.

According to the invention, a means is provided whereby when the operator focusses the optical system, the focal plane shutter (usually of fabric) which acts as the reflecting surface during focussing is pressed back against the plate or plate holder, so that its reflecting surface lies in the true permanent focal plane of the camera, during the operation of focussing, and

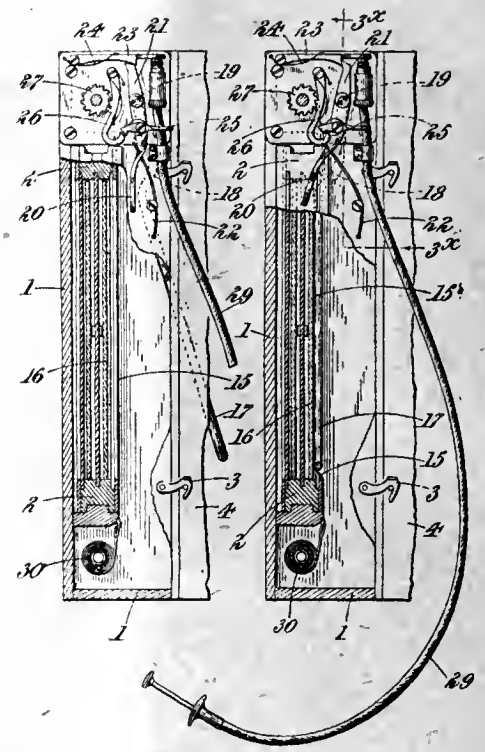


Fig. 1. Fig. 2.

means are provided to prevent the release of the shutter or blind whilst thus under pressure and distortion, the act of releasing the shutter to expose being synchronous with its release from pressure.

In carrying out the invention, for use in conjunction with the preferred embodiment thereof, a spy-hole is provided, normally covered, but uncovered against resilient resistance by the operator, preferably by the pressure of his eyebrows or temple upon a suitable pad. Shaped cushions or a pliable mask or like device may be used to fit closely against the operator's face to exclude light. Through the holes, the operator can then inspect the image formed on the focal plane shutter, which may be of white or light colour in order better to reflect the light.

In the drawings, figs. 1 and 2 show the rear end of the camera in broken section across the axes of the shutter rollers, in the position after the exposure and in that during focussing or prior to exposure. Fig. 3 is an elevation of the rear part of the camera with plate holder and shutter as if seen from the lens of the camera in section on 3x—3x of fig. 2.

The rear part of the camera comprises a shallow rectangular frame 1, fitted with any usual plate carrying device 2. The frame 1 is attached to the body of the camera by clip hooks 3.

The body of the camera comprises a rectangular frame 4 of wood forming a housing for the ordinary bellows when the camera is shut up. A hinged platform (not shown) may provide a support for the bellows and lens carrier when they are extended, and is of ordinary type, closing the camera when shut up.

According to this invention the reflecting surface, being the flexible focal-plane shutter 15, is pressed back against the plate 16 or plate holder by a wire frame 17 which contacts with it around the edges of the reflecting area, leaving a clear space on which to sight. The wire frame 17 is bent as at 18 to afford even pressure on the shutter 17. It is mounted pivotally at 19 in the frame 1 of the apparatus, carrying outside the frame a finger lever 20 provided with an extension 21. The lever works against a spring 22 which tends normally to keep the frame 17 away from the shutter 15. The extension 21 is provided with a catch which engages the trigger 23 which is released by hand pressure, either directly or by bulb or Bowden wire 29 or similar method. A light spring 24 tends to press the trigger into engagement with the extension 21. Mounted on the lever 20 is another small pivoted catch member 25 which engages (when the lever 20 is in operative position as in fig. 2) with the shutter pawl 26 engaging the pinion 27 on roller 28 of the shutter mechanism. The roller 28 is furnished with a kinding-knob, which

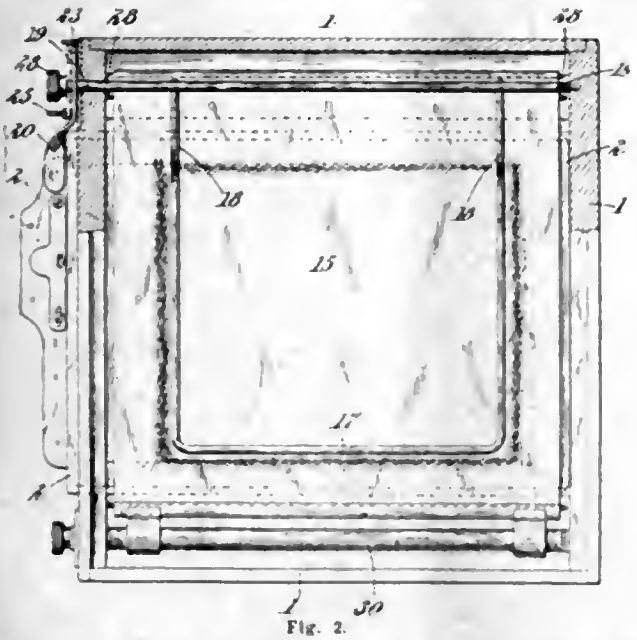


Fig. 2.

may be incorporated with the pinion 27. The bottom roller 30 of the shutter is of ordinary spring-wound type. The reflecting surface of the shutter 15 may be painted white or light colour and may be lined or otherwise marked to show the field as an aid to view-finding. If the plate be resiliently mounted the shutter may be pressed so as to be exactly in the focal plane.

The operation of the device is as follows, the operator winds the shutter up in the usual way, and then presses lever 20 until spring 24 forces trigger 23 in engagement with 21. The frame 17 is now held as shown in fig. 2, pressing shutter 15 against plate 16. In pressing lever 20, catch 25 will engage (under influence of a light spring) with the pawl 26 (also pressed by light spring).

The operator then inspects the image thrown on the shutter 15 through the spy holes provided. When the exposure is to be made, he raises the trigger by the wire device 29, thereby releasing 21, and the frame 17. In flying out, this causes the release of the pawl 26 and the shutter rewinds on to roller 30 as usual. To rewind, the catch 25 is released from the pawl by hand, thus allowing the pawl to operate as usual. It will be observed that the difference between the true focal plane as found by the operator, and the planes of the plate, is only that due to the thickness of the shutter, which is negligible or may easily be allowed for calibration of the focussing device, or be eliminated by resilient plate mounting as above.—Bertram Lewis, 6, Upper Terrace Road, Bournemouth.

Dyeing Photographic Images.—No. 160,137 (March 11, 1921).—The object of the invention is the treatment of a photographic silver image on a plate, film, or paper, in such a manner that it can be dyed with acid or azo dyes, one particular feature of the treatment being that the silver compounds remaining in the treated image are light-insensitive, and do not tend to re-develop when exposed to reducing agents or developers.

The advantage of a bleach which produces non-redevelopable silver compounds is to enable a further printing in the same emulsion without resensitizing after the first image is developed and bleached, without having the silver compounds produced by bleaching the first image re-develop with the development of the second image. In other words, the silver compounds produced by the bleach used are not reducible (to black silver) by a developer, nor will these silver compounds be affected by the light used in printing the second image. That is to say, while a bleach might produce a silver compound which would not be reduced by a developer, if this silver compound were light-sensitive it might then be reduced by a developer, after exposure to light, being changed thereby into the reducible form (printing in the residue of the sensitive emulsion for the second image).

The invention is of special use in the production of long strips of coloured images for motion picture projection, but the invention is also applicable to plates, films, and paper prints of various kinds, whether transparent or opaque. A special application of the invention is in the production of natural colour transparencies, as in motion pictures, wherein each picture area carries several images coloured with complementary colours.

According to the invention, developed silver images are bleached in a bath which transforms the silver into a compound non-redevelopable by a developer and simultaneously deposits on the image a substantially transparent compound of a metal having the capacity of absorbing and fixing an acid or azo dye in proportion to the original density of the image, which is then dyed in acid or azo dyes, with or without removal of the converted silver, the dye being mordanted or fixed only at the places *in situ* with the original silver. A bleaching bath is used for carrying out the process, a bath containing copper or chromium salts, or preferably both; for instance, it has been found that a bath containing potassium bichromate, potassium bromide, copper sulphate and hydrochloric acid gives very good results. The bleach makes the image transparent, even without removal of the non-redevelopable silver salts by hypo, so that the second image can be printed through the first.

The invention provides a process wherein acid and azo colours, such as ponceaus, fast reds, blues and greens, acid fuchsine, and yellows, now used in the wool dyeing industry, can be employed for dyeing photographic images, with the advantages of providing the necessary choice of pure, non-dichroic colours, and complete transparency, fastness, brilliancy and sharpness of coloured image in long lengths of commercial film.

The process starts with a black and white positive, which has been developed, and surplus silver removed by fixing in the usual manner. The coating is then hardened by immersion in a 10 per cent. formaline bath, and washed to remove excess of formaline. This sets the gelatine coating and renders it dye-repellent or tends to prevent it from retaining the dye. The hardening is also important in preventing the gelatine outside the image from taking up the dye. There may be a mechanical absorption of dye in the hardened gelatine, but as it does not fix on the unbleached gelatine it readily washes out in the clearing bath.

The image containing metallic silver is next treated with a bath having the characteristic properties stated, which precipitates or deposits a transparent insoluble mordant *in situ* with the silver, and in exact proportion thereto. This bath also changes the silver to a form which can be dissolved out without affecting the transparent mordant. The action of this bath, it is believed, is to deposit a transparent compound of copper or chromium, or both, or a double transparent compound of copper and chromium, in proportion to the silver, since the image has a brownish colour in reflected light, possibly due to silver oxide, which colour entirely disappears by treatment in the subsequent fixing bath, leaving no silver or silver compound in the residual transparent image. At the same time, the transparent copper or chromium compound is not affected either as to its transparency, or its character as a mordant. It is not known whether the result of the copper chromium bleach is to produce a copper chromium salt which mordants the dye through the reaction with

silver or whether it is a copper chromium gelatine compound, produced through the reaction with silver, which mordants the dye.

The conversion bath comprises potassium bichromate, 4.75 grammes; potassium bromide, 9.5 grammes; copper sulphate, 14 grammes; hydrochloric acid, 10 c.c.; water, 1,000 c.c. Nitric or acetic acid can be used instead of hydrochloric acid. This may be at between 70 deg. F. to 110 deg. F., and only requires a few minutes. The image is then treated in an acid fixing bath to dissolve out the silver compound to give better transparency. This may be done after as well as before the dyeing, without affecting the colouring. After washing for five minutes, the image is ready for dyeing, being now transparent and containing agents capable of fixing acid or azo dyes. The dyed print when washed contains brilliant whites and sharp contrasts probably owing to the treatment having destroyed the normal affinity of the gelatine for acid dyes and the dye only taking in the original image portions.

The dye bath may vary in strength and temperature, but is preferably at about one half per cent. strength at a temperature of from 70 deg. to 130 deg. F. About two minutes' immersion will be sufficient. The working of the dye bath may be sometimes improved by adding 20 c.c. of acetic acid for each gramme of dye. The previous treatments of hardening and conversion have so affected the coating that even a steaming hot dye will not injure the film, nor affect the mordanting and dry absorptive qualities of the transparent copper, or other compounds composing the image. Washing in hot water at from 70 deg. F. to 120 deg. F. for about three minutes will clear the dye from the whites without degrading, or weakening the dyed image, which has the original sharpness, is as transparent as a pure dye image, and has the requisite brilliancy of colouring.

In the above treatment, the gradations of the image are retained so that the dye is absorbed exactly in proportion to the density of the silver. The bleached images absorb dye with or without removing the non-redevelopable silver salts. If the bleached image only absorbed dye after being fixed out in hypo, in making a double (oppposite) coated positive, it would be necessary to fix out the bleached image without touching the unexposed side which would preclude immersion baths. Immersion baths are simplest and cheapest to operate because of less amount of care and time required. This process is particularly advantageous when it is required to obtain two photographic images within one single sensitized coating.

A modification which gives good results is to employ a ½ per cent. solution or sulphurous acid for brightening the colour. This can be put in the dye bath, or used as a dip after the whites have been cleared of dye by washing.

A very satisfactory "two (or more) colour" motion picture transparency can be produced by having one colour, as blue or blue green, made by toning a red family colour value, as with prussian blue in the well-known manner, and another colour, as red or orange, by colouring a green family value by this process, which gives complete transparency, good balancing, etc. These colours may be in one coating on the support, or in separate coatings on the same side of the support, or in coatings on opposite sides of the support, the images on each area in all cases preferably being registered by pins in the printing apparatus with reference to a pre-determined perforation or perforations as a standard. Also, both colours may be produced by this process, or three or more colours, so combined as to render a complete colour on each image area, or additively on successive image areas.—William Van Doren Kelley, 531, Clifton Avenue, Newark, Essex County, New Jersey, U.S.A.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

GRIFFIN (DESIGN).—No. 422,390. Chemical substances used in manufactures, photography, or philosophical research, but not including paints, colours, varnishes, or distempers, and not including any goods of a like kind to any of these excluded goods. Samuel Guest, trading as George Guest & Co., 5, Oswald Street, Glasgow, merchant. January 17, 1922.

KODATONE.—No. 427,505. All photographic papers. Kodak, Ltd., Kodak House, Kingsway, London, W.C.2, dealers in photographic materials. June 29, 1922.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, SEPTEMBER 11.

Edge Hill Camera Club. Outing to Sefton Maghull.
Southampton C.C. "Making Prints with Printer's Ink." R. F. C. Tear.
Wallasey Amateur Phot. Soc. "After Work on Bromide Prints, etc." T. H. Greenall.

TUESDAY, SEPTEMBER 12.

Bournemouth Camera Club. "Home Photography." A. Dordan Pyke.
Exeter Camera Club. Portfolio by E. R. Bull, F.R.P.S.
Hackney Phot. S. Print and Slide Competition: "A Flower Study."
Manchester Amateur Photographic Society. Lecture, "Some Beauty Spots in North Ireland." J. D. Berwick.

WEDNESDAY, SEPTEMBER 13.

Dennistoun Amateur P.A. Improving our Methods (suggestions).
Partick Camera Club. Print Criticism.
Rochdale Amateur Phot. Soc. "Enlarging for Beginners." W. Lord.

SATURDAY, SEPTEMBER 16.

Bradford Phot. Soc. Outing to Hawksworth and Tong Park.
Dennistoun Amateur P.A. Outing to Bothwell Castle.
Hackney Phot. Soc. Combined outing with N. Middlesex Society.
Partick Camera Club. Outing to Dumgoyne.
South Glasgow Camera Club. Outing to Dumgoyne.
Wallasey Amateur Phot. Soc. Outing to Frankby and Greasby.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

An emergency meeting of the Council was held on September 1, 1922, at 35, Russell Square, to consider principally the final arrangements for the congress and exhibition.

There was present: Messrs. Marcus Adams, Angus Basil, Arthur Bennett, Frank Brown, W. B. Chaplin, Gordon Chase, Alexander Corbett, C. F. Dickinson, W. E. Gray, Reginald Haines, George Hana, William Illingworth, Herbert Lambert, R. N. Speaight, Lang Sims, H. C. Spink, F. G. Wakefield, and W. H. O. Wedlake, with Mr. Alfred Ellis (secretary), and Mr. Jenkyn Griffiths (editor).

Mr. Alexander Corbett took the chair.

Apologies for absence were read from Mr. Swan Watson (president), Mr. Chapman, and Mr. Chidley.

The council considered, in committee, the final arrangements for the congress and exhibition.

The secretary, asking for voluntary help, Mr. Frank Brown and Mr. Wedlake undertook to collect the tickets at the various stages of the Windsor excursion, Mr. Haines and Mr. Chase to collect the tickets at each of the other outings, Mr. Bennett to collect the tickets on the occasion of the Tuesday luncheon, Mr. Lang Sims to be at the door on the occasion of the lectures and other meetings to see that these were restricted to members of the congress, and Mr. Haines to act as master of the ceremonies at the president's reception.

Mr. Haines reported that a number of London studios would be available for visits on the Wednesday morning, but that arrangements as to some of them were not yet completed. It was suggested that in addition to those already approached, Mr. Oscar Hardee and Mr. Banfield might allow their studios to be visited, and Mr. Haines undertook to try and secure the necessary permissions. Mr. Sims reported that the studios of the Amalgamated Press would take seventy-five visitors.

With regard to the assistants' evening, Mr. Chase reported on the number of applications so far received for tickets, and it was agreed that if any assistants came who had not the proper tickets, Mr. Sims, who would be at the door, should use his discretion as to admittance.

It was stated that Mr. Charles Aylett and Mr. J. Kennedy, of Toronto, and Mr. Pirie Macdonald, of New York, had already arrived; also that M. Pasquad, editor of *Photo-Paris*, intended to be present.

Mr. Lambert gave details of the musical programme. He proposed to engage the services of a trio of instrumentalists throughout the week, and to have each session opened with a little music. The

musicians would be engaged in the exhibition room when not actually in the congress room.

It was decided to ask the president of the Royal Photographic Society to take the chair on the Tuesday evening, Mr. Corbett, on the Wednesday afternoon, and Colonel Moore-Brabazon, M.P., on the Wednesday evening. Other subjects for brief discussions on the Wednesday afternoon, in addition to the one announced, were called for, and Mr. Haines agreed to ask Mr. Drummond Young to open a discussion on some subject of interest; Mr. Frank Brown undertook to open one on "Photographic Parasites," and Mr. Wakefield, one on "The Enlargement Question"; while it was suggested that "Co-operative Advertising" might also be discussed. It was agreed that openers be limited to ten minutes.

The Council then went out of committee, and Mr. Illingworth formally proposed, and Mr. Brown seconded, that all the arrangements involving any expenditure which had been agreed to at that meeting by the Council sitting as a committee should be approved. This was agreed to unanimously.

Mr. Hana asked for some suggestions from the Council as to the line he should take in his address on "Assistants as Associate Members." Several members of Council gave their opinions, but the general sense of the discussion was that Mr. Hana should speak as an individual member without compromising the Council.

The Exhibition.

Mr. Speaight reported that the exhibits had come in most satisfactorily; the exhibition would be larger and more representative than it had been before. It was altogether a magnificent show. Mr. Basil had taken over the work in connection with the English section, and Mr. Adams was looking after the Continental section. The Selection Committee—which was distinct from the judges who awarded the actual medals—consisted of Mr. Bertram Park, Mr. Banfield, Mr. Lambert, Mr. Basil, Mr. Wakefield, and Mr. Corbett, and Mr. Herbert Vandyke was also to be asked to serve.

Mr. Wakefield raised the question of the insurance of the exhibits, and on the motion of the Chairman, seconded by Mr. Basil, Mr. Wakefield agreed to approach the Fine Art Insurance Company with a view to the insurance of the picture exhibits, and to ask the same firm to negotiate with the stall-holders as to the insurance of their exhibits.

Mr. Haines reported that the cost of the catalogue was well covered, and that each stall-holder, as well as the General Electric Company, would be allowed a special advertisement. The question of complimentary copies was left to Mr. Haines's discretion.

New Members, Deaths, and Resignations.

The following new members were admitted:—Miss K. L. West (Rochester), J. Dixon Scott (Holborn), E. Lucker (Bournemouth), E. Milner (North Finchley), W. A. Sivyer (Greenwich), E. J. Edwards (in place of R. H. Hudson, retiring, of the same firm), E. O. Reynolds (Strond), G. Hughes (Histed, Baker Street), E. Millar (Sloane Street), E. Bradshaw (Padiham), also Lydell Sawyer (Sloane Street) rejoining.

The death was reported of Mr. Blunt Turner, partner of Mr. F. Read, Stockport, and the resignations of Bapuji Gehangi, of Bombay, and G. W. Lawrie, of Lucknow.

The Secretary asked for instructions as to the admission of members during Congress week, and it was agreed that he should have the power to accept nominations, and that if in any doubt he should consult Chairman of Council or Treasurer.

"Record" Committee.

The Chairman reported on the meeting of the Committee appointed at the last meeting to discuss the management of the "Record." The Committee had met and had agreed to recommend to the Council that the Editor should have entire control of the "Record," and should be assisted by an advisory committee, which, for the two next issues, would meet twice a month, the Committee to consist of Messrs. Adams, Hana, Wakefield, and the Secretary. Mr. Speaight had kindly agreed to act as honorary treasurer of the "Record" finances for six months, and had also accepted the duty of collecting the accounts and of placing the financing of the "Record" in proper working order, such as would be approved by the accountant of the Association. Mr. Illingworth proposed, and Mr. Frank Brown seconded, that the report with the recommendation be adopted, and that the Committee, as stated, be appointed, to be called the Publications Committee; further, that any expense incurred by Mr. Speaight in the shape of allowances to his secretary for getting the accounts in order should be met out of the "Record" funds. This was agreed to unanimously, and Mr. Speaight was thanked for his offer. The Propaganda Committee was thereby dissolved.

The British Empire Exhibition, 1924.

The Secretary read a letter he had received from the Secretary of the British Empire Exhibition in reply to his own letter as instructed at the last meeting, stating that after due consideration of a large number of applications, the concession of photographic rights had been granted to Messrs. Campbell Gray, Ltd., who, in addition to being contributors to the guarantee fund, offered the most favourable terms.

Mr. Wakefield stated that he had had an order from one firm for photography in connection with the exhibition. The firm was one for which he had been accustomed to do photography for many years. On making the usual preparations for executing the order he was told that permission must be sought from Messrs. Campbell Gray, and when he asked this firm for permission he was told that Messrs. Campbell Gray themselves would do the work for two guineas, or that they would require two guineas if the work was done by someone else. This was a prohibitory tax, because the order itself was not more than a two-guinea one.

After some further discussion, it was decided that information as to the exact terms of the contract should be procured, and that the matter should be brought forward again for discussion after the Congress.

The Edinburgh Society of Professional Photographers.

The Secretary read letters which he had received from the President and Secretary of the Edinburgh Society of Professional Photographers, arising out of some recent discussion as to whether the Edinburgh Society was affiliated with the Association. Both letters conveyed very friendly feelings and a desire for co-operation, and the President wrote assuring the Association that there was no unfriendliness; the object of drawing attention to the matter at the meeting in Edinburgh was simply to correct a technical error. The interests of the two bodies were in common.

The Chairman said that this was a very satisfactory explanation of what seemed, in print, a very terse statement.

Nominations for the Council.

Mr. Sims proposed, and Mr. Chase seconded, that Mr. Futcher, of Southsea, who had expressed his willingness to be a member of Council, be nominated for the Council. It was stated that a ballot would entail only a very slight expense and trouble. The nomination was agreed to.

This concluded the business, which had occupied four hours.

Commercial & Legal Intelligence.

NEW COMPANIES.

Precision Photo Printing Plant, Ltd.—This private company was registered on August 23, with a capital of £10,000, in £1 shares. Objects: To acquire from S. H. Morse his interest in a certain patent, and to carry on the business as indicated by the title and that of engineers, etc. The first directors are: E. W. Smith, Eastwood, Worcester Park, Surrey (chairman); S. H. Morse, Clarendon Hotel, Watford. The last named is permanent. Qualification: £1. Remuneration at the rate of £50 each per annum. Registered office: 120, Moorgate Street, E.C.

Christie & Hodgson, Ltd.—This private company was registered on August 29, with a capital of £2,000 in £1 shares. Objects: To take over the business of manufacturers of and dealers in photographic, optical, lantern, electrical and wireless apparatus, and cabinet and general woodworkers, etc., carried on by James Christie & Sons, Ltd., at 246, West Street, Sheffield, and generally all or any of the assets of the retail business of the said company. The first directors are: J. Christie, 222, Ecclesall Road, Sheffield (managing director and chairman); G. Christie, 26, Edgebrook Road, Sheffield (both directors of James Christie & Sons, Ltd); E. O. Hodgson, 57, Wake Road, Sheffield. Qualification: 1 share. Secretary: J. Christie. Registered office, 246, West Street, Sheffield.

News and Notes.

"The Club Photographer" for September is a Keighley Number. It contains pictures and useful articles by A. S. Dean, E. Horner, H. R. Wade, W. Speight, and other members of the Keighley and District Photographic Association.

The R.P.S. Exhibition will this year have the distinction of being formally opened by Mr. Solomon J. Solomon, R.A., president of the Royal Society of British Artists. The function will take place at 35, Russell Square, on Saturday, September 16.

Mr. A. Dordan Pyke asks us to note that his address is now :—Oulton, Meadway, Epsom, to which letters should be sent dealing with his numerous engagements as a lecturer before photographic societies on the goods of a number of leading photographic firms.

Photographers get the best advertising in the world, according to A. A. Chilcote, of Cleveland, who says :—"People don't buy a dozen pictures to look at themselves. They buy them to give away and indirectly advertise you. People gladly pay a dollar more a pound for candy when it is done up in a pretty box; you can apply the same principle to photographs."

Wold Air Brushes.—We have received the catalogue of the air brushes made by the Wold Air Brush Manufacturing Co., 2173, North California Avenue, Chicago, a firm which manufactures a large number of types of air brush for photographic and other purposes, together with accessory apparatus, such as air-compressing equipment, and a large selection of the necessary colours.

Parcel Post to India.—The Postmaster-General announces that henceforth parcels for India should not bear adhesive customs declarations, but must be accompanied by despatch notes and non-adhesive customs declarations, like parcels for foreign countries. One despatch note and customs declaration may be used for not more than three parcels from the same sender for the same addressee.

MM. E. Krauss, 18-20, Rue de Naples, Paris, have just issued a 64-page catalogue of the photographic lenses and other optical apparatus manufactured by them. They are makers under licence of the various models of Zeiss lens, and also of a considerable variety of cameras, including several stereoscopic instruments, a folding focal-plane and the very ingenious "Photo-Revolver," taking 48 plates measuring 22 by 36 mm. The list is obtainable by those of our readers who are interested on application to the firm in Paris.

Photographs of Salesmen are used in an American store to aid customers in identifying them. The Philadelphian "Bulletin of Photography" says that in the furniture department of a large store in Pittsburg is a bulletin board on which are posted the photographs of the salesmen in the department with their names under them. The department has found that "lookers" often return determined to buy. They prefer to be waited on by the salesmen who showed them articles on their previous visit to the department, but almost invariably have forgotten to ask their names. So, except for the photographs, they would have no way of finding the salesmen unless they happened to see them in the department.

Plaster Casts.—From time to time we have referred those requiring a classical cast for use in the study of studio lighting to the firm of D. Brucciani & Co. We now learn that the business of this firm has been transferred to the Board of Education and removed from Goswell Road to the Victoria and Albert Museum, South Kensington, London, S.W.7, where it is under the direction of Mr. Paul Ryan. A catalogue has been issued very fully illustrating the casts of many statues, busts and other examples of classical sculpture, which are supplied at relatively moderate prices. For example, that of the Venus de Capua, No. 2265, is sold for about 18s., whilst that of another suitable as a still-life model, namely, The Boy, by Luca della Robbia, costs about 13s. Packing and carriage are extra to the prices in the catalogue.

The Antiquity of the "Tintype."—The "tintype" or "while-you-wait" photograph is in principle no new thing, says a writer in the "Bazaar." The modern examples, however, are produced by the "dry" method, whereas the older forms were by the "wet" method. The latter necessitated a dark-room (once a familiar object of the seashore, and not even now quite disappeared), because of the tin "plate" having to be prepared immediately before use. This old process was first "thought out" in 1853 by an American, who had to send photographs—then commonly made upon glass—by post. The process was first worked commercially in 1855 by another American—J. W. Griswold—who named his results "Melainotypes," but this was soon changed to "Ferrographs," and there were frequent references to the latter in the English photographic Press during 1856. This style of portraiture enoyed a tremendous boom about 1880, but it gradually died down, only to be revived when the "dry" process came along with the compact "cannon," "button," and other types of easily-manipulated cameras, as are now commonly used.

Congress Finals.—Members of the P.P.A. who are attending next week's "coming of age" congress, are asked particularly to note the following items respecting the conditions of attendance :—Members who have not obtained their congress membership card will be admitted to the annual general meeting on presenting the notice convening the meeting at the entrance to the Prince's Galleries, Piccadilly, W.1.

It is imperative that members should bring their congress membership cards with them, as these must be shown on all occasions (with the exception of the annual general meeting) in order to obtain free admission.

Members who have not paid their subscription for 1922-23 and are not in possession of their membership card, are not entitled to vote at the annual general meeting, or to have free admission to congress lectures or excursions. Each member may bring a professional friend to the congress by obtaining a special card (price 5s.) from the secretary, Mr. Alfred Ellis. This card confers the privileges of membership during the congress week.

Special attention is asked to the fact that only 130 persons can take part in the congress dinner, and that, therefore, early application for tickets should be made. The dinner will be held at the Prince's Galleries on Friday evening, September 15, at 7 o'clock.

Prevention of Art Forgeries. — Art connoisseurs have been much disturbed recently about the number of clever imitations of famous masters which have found their way into sale-rooms, and none of the suggestions so far made for preventing forgery promises to be really effective. One of the best, which, if carried out, would put an end to forgeries so far as present and future masters are concerned, is made by M. José Théry, a barrister of the Court of Appeal. Briefly (says the "Daily Telegraph") his proposal is that a register of pictures should be established which would identify them from the day of their completion. An artist of note on finishing a work would notify the fact to the official registry of pictures, giving full details of his picture and two photographs, one of the work as a whole, and the other of a very small part of it, so enlarged as to show the smallest detail of the brush marks and texture. Each sale of the picture which followed would be recorded in the register, so that a purchaser on buying a well-known work could obtain with it a document almost corresponding to the certificates issued concerning animals registered in stud books. The chief flaw in the scheme appears to be that it is often the works of artists little known in their time which in later years are recognised as masterpieces. It is just these which would not have been registered by their modest creators.

Record and Survey of Sussex.—The Photographic Record and Survey of Sussex is continuing its useful work of preserving for future generations pictorial records of objects of interest in the county. Photographs of the removal of the statue of George IV. from the Old Steine site at Brighton are among recent additions. At the annual meeting, held last week at the Brighton Public Library, Mr. J. S. North appealed to people interested in photography to send copies of their photographs. There were thousands of photographers in the county, he said, who had never sent a print. Probably they thought them not worth sending, but in course of time the photographs would become very valuable. What was wanted were photographs of any building likely to be destroyed, the entrances to towns and villages, etc. What would they not give for a view of the entrance to Brighton 50 years ago? Mr. Law moved the adoption of the report, which stated that in consequence of the cost of photographic materials, only a few additions had been made recently to the collection at the Public Library, Brighton; but as the price was now lower the Council had decided to add a number of photographs of interest during the next few months. There were some 3,000 prints and sketches, also 500 lantern slides for lecture use in the collection. The officers were re-elected en bloc. Mr. Frederick Harrison (Hon. Secretary) drew attention to a circular sent out by the Sussex Archæological Society with reference to the formation of a collection of photographs. This he thought was duplicating the work of the Photographic Record

to which the Archæological Society transferred that branch of its activities some years ago. It was decided to communicate with the Council of the Society on the subject. Mr. Harrison mentioned that there was a possibility of acquiring the collection of negatives made by the late Rev. Walter Marshall.

GEORGE EASTMAN'S £1,000,000 CINEMA.—A "Daily Telegraph" special article describing the use made of moving pictures by American Universities says: The great new model theatre which Mr. George Eastman has built at a cost of more than £1,000,000, and presented to the University of Rochester, New York, possesses, it is said, nearly a score of organs, including one instrument of unusually large dimensions, equipped with every kind of accessory the ingenuity of the builders could invent. Far more significant than the size of the organ, however, is the fact that, by accepting Mr. Eastman's gift, and consenting to operate the theatre on its own account, one of the leading universities in the United States sets the seal of official approval and recognition on the screen as a great educational force. Not only is it intended to develop the moving picture on scientific lines, but also to train musical students how best to interpret what they see on the screen in terms of music. The theatre, which is fitted up with every device skill can contrive for the comfort and convenience of the 3,400 audience for whom seats are provided, will, it is hoped, serve as a model for the owners of commercially run cinema theatres all over the United States. The novel lighting and ventilating arrangements, as well as whatever improvements in other directions are subsequently developed, are to be placed fully and freely at the disposal of any picture exhibitor who cares to copy and adopt them. Although Rochester is the first university in the States to possess a theatre of its own, ten other American universities, including Yale and Chicago, are already actively engaged in the production of films, and a score of normal schools, colleges, and universities have regular courses in visual instruction. The University of Nebraska has erected a moving-picture studio, and at least four others, including Columbia and New York, are conducting careful scientific investigations into the value of the film as a means of education. Thirty-four cities in the States are now using educational films in their schools. There is thus rapidly coming into being in America a vast mass of enlightened opinion which accepts films as a matter of course, forming a striking contrast to the attitude of official apathy and veiled distrust still too prevalent in this country.

Correspondence.

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

*** *No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

PHOTOGRAPHS FOR BLOCK-MAKING.

To the Editors.

Gentlemen,—While pleading justification in regard to the charge of cynicism in the quotation made by E. H. A., from my article, I must most emphatically enter a plea of "not guilty" to the charge of untruth. I would prefer to define a cynical remark as an "obviously sarcastic exaggeration." Certainly I did not say, or even wish to suggest, that blockmakers actively encourage bad photography in order to keep their art departments going.

No one, however, will surely deny that when photographs sent for blocks are unsatisfactory the possibility of artist's work to make a good result is earnestly recommended. This, of course, is only one of the many factors that have made good photographs requiring no retouching, the exception rather than the rule.

E. H. A. only says that he *believes* my statement to be untrue. He also calls it an aspersion, which, I hope, it is now clear my statement was not intended to be. E. H. A. makes a further suggestion that the retouching is not profitable to the blockmaker. I will not attempt to dispute this point beyond remarking that it looks like asking for more cynicism! As regards his belief, I have always had a strong predilection for facts over mere beliefs that has often got me into hot water. Here goes, however, for another dive.

Fact No. 1.—For many years I have made photographs for blockmaking, either for engravers or printers or for their clients.

Fact No. 2.—A photograph that needs no retouching involves (over an "ordinary" one) a varying amount of trouble=time=money.

Fact No. 3.—Incidentally it requires also a deal of cerebral exertion. That form of labour, however, appears to be considered of little tangible value.

Fact No. 4.—The extra trouble=time=money involved in the "best possible" photograph is far less usually than the cost and time of retouching.

Fact No. 5.—It is extraordinarily difficult to make people see this.

Fact No. 6.—Even when they see it, people often prefer to carry on as usual. For these reasons one can seldom made a "best possible" photograph.

Fact No. 7.—Having been very early and thoroughly inoculated with the theory of the comparative apprentices, I have spent nearly a quarter of a century and much money in trying to acquire the ability to make "best possible" photographs. In my earlier journeyman days the effort frequently involved the sacrifice of ordinary human needs (both inner and outer) to the object in view.

Fact No. 8.—Some people who are acquainted with my work think that those efforts have been worth while.

Fact No. 9.—When they learn the amount of the remuneration weekly that such work commands (?) they usually reverse that opinion.

Still, everybody knows I am always pleased to assist anyone in technical doubt or difficulty to the best of my power. E. H. A.'s friend could have saved his hundred pounds. I should have been glad to guarantee him success for a fifth of that.

If my desire to advance the production of better photography has made me cynical, in face of the craze for cheapness and rush, let me assure E. H. A. there is not an atom of ill-feeling about it.—Yours faithfully,

D. CHARLES.

50, Webb's Road, S.W.11.
September 2.

THE R.P.S. JOURNAL.

To the Editors.

Gentlemen,—In your issue of August 25 Dr. S. E. Sheppard says that a paper of his sent to the R.P.S. "Journal" was rejected. That is, of course, a question that concerns the Journal Advisory Committee, who doubtless had reason for their decision. But when Dr. Sheppard adds parenthetically that the article was abridged "because the 'Journal' does not publish lengthy papers," I feel that the statement should not pass without comment.

Of course, the term "lengthy" is not particularly definite, and I have no idea what number of words it connotes in Dr. Sheppard's mind. Speaking roughly, the "Journal" averages just over 40 pages available for ordinary letterpress, and a "solid" page contains about 800 words. It is no unusual thing for an article to run to a dozen pages, say, 10,000 words, and I should consider this fairly lengthy for such a small magazine. Only in July Dr. Sheppard had a paper which, with diagrams, ran to 14 pages, just one-third of the usual entire space available. In face of such facts I consider Dr. Sheppard's statement misleading, and calculated to give a wrong impression to other contributors.—Yours faithfully,

South Woodford, E.18. W. L. F. WASTELL.
August 31, 1922.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5 cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

B. D.—A gas printing box can be constructed on the lines which Bartholomew & Co., 40, Gerrard Street, London, W.1.

B. D.—A gas printing box can be constructed on the lines which you have indicated, but we should recommend you to purchase one ready made, as it is not easy to make the metal part re-

quired for the light. Messrs. Butcher issue a very good one, the "Klimax," at a reasonable price.

R. R.—You may safely use the ordinary quality of methylated spirit for print cleaning. We have not found any disadvantage from the presence of the small proportion of mineral spirit, while the violet dye tends to correct any green tinge on the lights, if, indeed, it has any effect at all.

J. M.—Although Poland has a somewhat extreme climate, cold in the winter and hot in the summer, it is not worse in this respect than many parts of Europe in which the ordinary plates and papers of the leading makers are regularly and satisfactorily used. We do not think it is possible to recommend one make in preference to another.

M. M.—A certain amount of gold is transferred to the fixing bath, and there continues the toning action. You should pass prints from the toning bath into a weak solution of sulphite of soda, say, 100 grs. of soda sulphite in 20 ozs. of water. This stops the toning action, and if prints are then washed, as they should be, in four or five changes of water before fixing, no further toning action will take place in the fixing bath.

R. L.—By skilful enlargement by highly diffused light, it is just about possible from the very best cinema negatives to make presentable whole-plate enlargements, but in most cases the grain of the film negative becomes very pronounced in the enlargement, unless a good deal of labour is spent in making an enlarged negative and retouching it. We think it is quite necessary practice to make separate still negatives if really good photographs are required.

T. T. A.—Carbon and semi-matt surface prints on developing paper will occasionally show spots of a different texture from the remainder, due to a little surface water collecting at that point during the drying of the print. While some workers have stated that there is no remedy for these, it is found that immersing the prints in a weak solution of alum—1 oz. of alum in 20 to 30 ozs. of water—and bringing the solution to a temperature of about 100 deg. F., will cause them to disappear when the prints are again dried.

P. E.—You are not quite explicit as to the style of title you require, white letters on black ground, or black on white. We do not know of any method of obtaining the latter except by using a photograph from a typed original. We do not know of any method in which thin celluloid is used, but we have seen successful results from type printed upon thin sheet gelatine. We rather fancy that the celluloid would not take the ink evenly, and it is difficult to secure perfect adhesion. The type impression would require dusting with bronze powder while wet to secure sufficient opacity.

G. W.—Potass ferrocyanide figures sometimes in developer formulæ and appears to have originated many years ago in the United States. So far as we know there is no material advantage in using it, and we should have thought that its appearance in developing formulæ had been abandoned many years ago. We know nothing about the plates that you are using, but if they fog we think that the best thing you can do is to add extra bromide to an ordinary pyro soda developer, up to, say, 2 grs. per oz. of working developer, or use a pyrocatechin developer made up according to the formula in the Almanac.

J. A. L.—It has not been our experience that parts of a bromide print, which have been reduced with iodine and cyanide, afterwards turned brown in colour either by exposure to the light or through other causes. We do not know what the cause may be in your case, possibly insufficient fixation of the original print. If plain cyanide solution reduces the print with sufficient activity (it usually does not) there is no reason against using it, but we should think it will have to be used in considerably stronger concentration than if combined with iodine, and one does not care to use more of such a poisonous solution than one can help.

P. F.—Most certainly the platinum residues are worth attention. Exhausted developers—and the acid baths if in quantity—are mixed in a large jar, with zinc and hydrochloric acid (spirits of salt will do). A dirty chalk-like precipitate is accumulated, and the clear liquor is thrown away. The platinum is precipitated in the mud, and the latter, when enough has accumulated, is sent to the refiners, after being drained from water as much as possible on a linen cloth. Waste prints, clippings from paper, etc., should be sent as they are or burnt to an ash in a place free from draught, such as a biscuit tin with a row of holes about half way up. They should not be mixed with the wet residues, as the two require different treatment for the extraction of the metal.

K. T.—(1) You can work in the manner you suggest if you are not particular as to quality. (2) If the plate has been exposed to a negative image. You cannot get a direct positive from the object in this way. The formula you give should answer with ordinary plates if you do not omit the ammonia. Like most other developing agents hydroquinone requires the presence of an alkali. Try the effect of a strip exposure, giving, with a small stop, say, one second to 16 seconds, and develop. From the resulting negative you will be able to pick out the correct exposure, and from this you can calculate the speed for larger openings. We do not think that any time is saved by combining developing and fixing. If you use a strong developer and about an 8-oz. hypo solution the total time taken will not be greater.

E. E.—The copyright of the photographs belongs to the individual who gave the order for the photographs, that is to say, the person whose photograph and that of his daughter have been reproduced. He can take action against the newspapers for infringement of his copyright, and, so far as we know, the newspaper has no good defence and cannot claim innocence in respect to the matter since they must assume that there was copyright in the photograph, and it is no defence, according to the Copyright Act, for them to say that they thought the copyright belonged to the person who submitted the photographs to them, whereas, in fact, it belongs to somebody else. We should think this would be a sufficient remedy for the father and daughter, since no doubt the newspaper would then take steps against the person by whom the photograph was submitted to them.

A. G.—(1) The paper is of the bromide type. (2) The following method will be found to give bright vigorous prints from flat negatives:—Expose the bromide paper in the usual way, developing it as long as any increase in depth is seen to be gained, ignoring altogether the discoloration of the high-lights—overdevelop it, in fact. After fixing and washing, pour over it the following reducing solution until it is seen to be considerably lighter; when it is, at once plunge into clean hypo for a few minutes. If it is not yet light enough it may be again washed, treated with reducer, and fixed. When it is seen that any further reduction will render the blacks grey, it is washed and dried. Many a negative otherwise quite useless may in this way be saved.

Potassium iodide	30 grs.	6.8 gms.
Water	10 ozs.	1,000 c.c.s.
Iodine	3 grs.	0.7 gm.

With this bath the whites of the print will assume a dark blue tint, owing to the formation of iodide of starch due to the sizing of the paper; this immediately vanishes upon placing in the hypo fixing solution.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. PRICE FOURPENCE.

TERMS OF SUBSCRIPTION POST FREE.

UNITED KINGDOM OR CANADA.—*One Year*, £1 1s. 8d.; *Six Months*, 10s. 10d.; *Three Months*, 5s. 5d.

ANY OTHER PART OF THE WORLD. *One Year* ..... £1 3s. 10d. *Six Months* ... 12s. 0d. *Three Months* ... 6s. 0d.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibits the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3254. Vol. LXIX. FRIDAY, SEPTEMBER 15, 1922. Price Fourpence.

Contents.

SUMMARY

The coming-of-age Congress of the Professional Photographers' Association opened on Monday last, when the exhibition of portraits and of trade exhibits was officially opened by the Earl of Carnarvon. (P. 547.)

The exhibits of professional portraiture are the most notable which have ever been brought together in this country, both as regards quality and number. In the British section the highest award was made to Mesdames Morter and the second to Mr Herbert Lambert. (P. 547.)

Some notes on the exhibition of portraits by Mr. F. C Tilney will be found on page 554.

Delegates from Canada and the United States were present at the opening of the Congress. Mr. Pirie Macdonald, for the latter country, made an eloquent appeal for close co-operation between the English-speaking peoples. (P. 549.)

The president, Mr. Swan Watson, of Edinburgh, delivered an interesting address, in which he illustrated the various types of lighting of portraiture from examples of the work of notable painters of portraits. He raised a question of the superiority of the habitual expression on a sitter's face in preference to a passing phase as a means of obtaining a real likeness. (P. 550.)

The trade exhibits at the Congress are shown on stands uniformly constructed by the P.P.A., and include goods by well-known firms and several quite new introductions. (P. 553.)

Mr. Alexander Corbett will be formally elected president of the P.P.A. during the course of the week. A portrait and notice appear on page 558.

The Salon opened at 5a, Pall Mall East on Monday last, and contains a still greater proportion of portraiture than has been the case even of late years. Appreciations by Mr. F. C. Tilney of some of the notable work form an article on page 555.

In a leading article we refer to some of the chief causes concerned in the accidental production of unsharp negatives. (P. 547.)

The suggestion may be made that lenses may be protected from the action of dust or fumes, whilst exhibited in dealers' windows, by the provision of an extra cap having a clear glass front. The latter would protect the lens itself, whilst not diminishing the effectiveness of the display in the window. (P. 546.)

An inexpensive igniter of flash powder is described in a paragraph in "Assistants' Notes." (P. 559.)

The running of a studio establishment may often benefit by the help given by travellers of the manufacturing firms who are themselves experienced workers. (P 546.)

EX CATHEDRA.

The Congress. A first glance round the Princes Galleries, Piccadilly, on Monday last, was sufficient to show the host of attractions which the Council of the P.P.A. had provided for members attending the "coming-of-age" Congress. Last week we showed the very full programme of lectures, discussions and visits which had been arranged, but the galleries provided a revelation of the comprehensive scale on which the exhibition had been planned and carried out. We refer elsewhere to the important collections of British and foreign professional photographic portraiture, forming a great international demonstration of the art of the photographic portraitist. Everyone must admit that this exhibition must add to the status and importance of portrait photography, and in the long run cannot help benefitting every studio which has an artistic aim in its work. On the technical side, the exhibition of apparatus and materials by manufacturers brought the ways and means of practical portraiture before photographers in the best possible manner. The stands were all constructed of a uniform pattern by the P.P.A., and were individually furnished and internally decorated by the various exhibitors. The credit for this part of the organisation must be given chiefly to Mr. F. Wakefield, who has worked with prodigious energy to make this part of the Congress a success, and who is to be congratulated on his efforts. Altogether, the Congress forms the most notable event in the history of the Association, and one which should strengthen and extend its future influence.

* * *

The Commercial Assistant. The budding operator, especially on the "commercial" side, is apt to prove himself unduly when he finds himself able to produce a technically satisfying negative with fair regularity. While the cleverest photographer does not always get a perfect negative, it must not be supposed that it is only a matter of obtaining accurate exposure and development. These can be so well standardised, and plates are so excellent, that only extremely adverse conditions should excuse a poor negative or print. The young photographer, like the public, thinks that to point the camera at a subject and to perform the functions of focussing and all the rest of it, is what the work of the photographer consists of. The hardened commercial operator knows different. He has to know how to persuade a group of grinning urchins that the wall just clear of the shop window is a much better background. He has to know that a silver cup will look like a cast-iron one if he takes it in a library full of sombre printed books. He has to cultivate a general knowledge of technical terms and points in all sorts of trades. The knack of being "all things to all men" is a very great asset to a commercial photographer.

Assistants and Travellers. It is no uncommon experience for a commercial traveller to be asked for names of suitable probables to fill a vacancy on the staff of a customer. While this form of labour exchange can be said to have much in its favour, there seems to be more than a passive neglect on the part of some employers to permit of meetings between their assistants and such representatives as call upon them. If it be the fear of losing a valued assistant that prompts this very general attitude, it suggests that the assistant has reason for a wish to change, but it may be said at once that the best assistants are those who have opportunities of learning what is going on in the profession. Many of the best travellers have been recruited from the profession, and in an informal stroll around the workrooms can sometimes bring forth suggestions that may be of much more far-reaching benefit to all concerned, that the question, say, of a fractional discount off a few gross of paper. We do not think that the fear of communicating trade methods which are thought to be unique need be a deterrent from thus bringing the technical trade traveller in touch with assistants in the workrooms. Photography has now become so exclusively the practice of well-known methods that it is inconceivable that a business may be injured by showing a firm's traveller all the ordinary details of its working.

* * *

Veiling on Lens Surfaces. We have noticed lately the prevalence of veiling on the surfaces of many high-class lenses, which are fitted to cameras offered for sale. These cameras and lenses are invariably shown in shop windows, and we feel that this veiling is caused principally by exposure to air and fumes, especially in the case of gas-lit premises. While direct sunlight cannot improve the surface of a lens, we are sure that it is not the primary cause of the veiling. It is, perhaps, unfortunate that good class lenses must be exhibited to the public in shop windows at all, as fumes, air, and dust in combination all help to deteriorate the surface in some way. Again, the necessity of constantly cleaning the lens surface from accumulation of dust is liable to cause slight scratching, which does not improve the brilliancy or polish of the lens. Naturally, the camera is not so effective a salesman when closed, so that it has to be shown to the public in its entirety. Some time ago, folding cardboard covers were supplied to dealers to be placed over the bellows of cameras, when exhibited in the shop window. This was a move in the right direction, but it did not offer any protection for the lens itself. The lens is undoubtedly the most vital part of the camera, and should be protected from the elements as well as from chance injury.

* * *

A Sales Lens Cap. We suggest, therefore, that each high-priced lens, and possibly those of lesser value, whether fitted to a camera or not, should be supplied to the dealer, with a loose cap, fitted with a clear glass front and made to cover the front combination completely. The ordinary cap is useless for the purpose, as it does not allow the lens to be seen without its removal. This cap could be made in either card or metal, the important point being that it should fit fairly tightly, and therefore exclude air and dust from the lens surface. The back combination of the lens is naturally protected by being inside the camera, and does not require any further covering, but the glass front of this protection cap would allow the prospective buyer to read the name of the lens maker and any other particulars, focus, stop value, etc., usually engraved on the front of the lens tube, so that no loss of advertisement would ensue. The cap would be of no use photographically, its only purpose being as a protection to the lens surface whilst the apparatus was in the dealer's possession. It could therefore be removed when a sale was effected, or if the dealer so wished could be supplied to the customer. The cost of such a lens protector would be quite trivial, and the lens would gain by being kept quite clean and free from chances of veiling.

UNSHARP NEGATIVES.

We have not in our mind such negatives as are of design unsharp or softly defined, but such as were intended to be perfectly sharp, and have failed to come up to expectations. Unsharpness may be due to one or more of many causes, some of which can be detected by simple inspection, while others are only manifest in the finished negative.

In tracing the cause of poor definition it is a good plan to start by examining the image upon the focussing screen, using a very sharp, well-printed page from a magazine or newspaper as a test object. The ground glass should be of the finest possible grain and, if new, should be rubbed with a little sweet oil or fat, as much as possible being polished off with tissue paper. A focussing eye-piece is needed by nearly every observer, unless possessed of extremely good eyesight at close quarters. With apparatus being in perfect condition, many cases of unsharpness are due entirely to the bad focussing. If it be found that it is impossible to get the smaller types on the page sharp enough to be read distinctly upon the ground glass, the defect known as spherical aberration is indicated. This is usually only present when the lens has a large aperture, and should disappear when the opening is reduced to $f/16$. This defect is sometimes present in high-class anastigmats of large aperture, say, $f/3$ to $f/4.5$, but is usually eliminated by stopping down to $f/6$, or thereabouts. If a reduction of aperture does not ensure sharpness, the trouble is probably due either to faulty centering of the lens components or to what is known as "bad figuring," that is to say, the curves are not truly spherical. It may also be due to stress having been put upon the glass by reason of a fall or other accident which has, sometimes invisibly, distorted the brass mounting. If the lens is of any value it is advisable to place it in the hands of a competent optician for overhauling, but if a cheap type of lens, it is better to discard it altogether, as the cost of correction, even if possible, would not be justified by the result.

If the image upon the ground glass appears to be perfectly sharp, a plate should be exposed and developed and, after drying, examined with a magnifier. That used for focussing is the most suitable. The reason for drying the negative before examination is to obviate the appearance of unsharpness caused by the swelling of the gelatine, which is considerable with some emulsions. If the image does not appear to be sharp, it may be due either to chromatic aberration in the lens or to want of registration between the ground glass and dark slide, and as the latter is the easiest to detect, it is as well to test for this first. This is done either by using a simple depth gauge made of a stout lath or flat ruler, having an ordinary screw fixed in the centre. The lath is laid across the ground glass frame and the screw turned until the point just touches the ground surface. It is then placed in the same position on the frame of the dark-slide, when the screw point should just touch the film of an old negative which has been placed in the slide. If there is any discrepancy, the ground-glass

screen should be packed up or sunk as needed. Each slide should be tested as, although externally similar, there may be a slight difference in their register. It should be noted that in slides which fall from the front, a difference in the thickness of the plates will sometimes be enough to affect the definition when a lens of large aperture is being used.

If the register be correct, chromatic aberration may be looked for. The simplest test for an unscientific worker is made by placing a large sheet or strip of printed paper at an angle of about 30 degs. to the axis of the lens. In the centre of the paper, a ring about an inch in diameter should be marked in pencil, and this point should be very carefully focussed on the exact centre of the plate. Upon exposing a plate, the lettering inside the ring will be perfectly sharp if the chromatic correction is all right, but if any portion outside the ring is sharper than that inside, it is not. It is rare to find this defect in high-class modern lenses, but if there be any suspicion of it the maker should be consulted, as it is to his interest as well as to that of the lens owner that it should be rectified.

An often unsuspected cause of unsharpness is wear in the camera fittings, which allow a slight change in the position of the back or front between focussing and exposure. For instance, if the rack adjustment be somewhat loose, it may slip a tooth or two while inserting the dark slide or drawing the shutter. Again, the clamping screws of the swing-back may not grip properly, allowing of a similar movement, while the front of the camera may be slightly displaced by the act of setting the shutter.

The tripod is not always to be relied upon; even an old and trusted stand will get a little shaky in the knees with long use and cause a slight tremble, not enough to give a double outline, but enough to spoil the definition.

When the greatest sharpness is necessary, care must be taken that the grain of the emulsion is fine enough to do justice to the lens. The selection may be made in a rough way by copying a piece of very sharp printed matter upon a slow lantern plate, and using this as a standard of comparison, with negatives made of the same subject, with the same lens upon the plates to be tested. With a pocket lens it can easily be seen whether the definition approaches that of the slow plate.

It must not, however, be assumed that the granularity of the image bears any definite relation to the speed of the emulsion, for lately great improvements have been made in rapid emulsions. For this reason it is desirable to make comparative tests with plates which may bear the same speed number.

THE P.P.A. CONGRESS.

The first two days of the Congress which have passed up to the time of our going to press have demonstrated its emphatic success, and have amply dissipated any doubts which some may have had of the success which would attend the experiment of a Congress in Piccadilly in September. The exhibition of portraiture, or rather "exhibitions," for there are several of them, must have surprised everyone who was not in the secrets of the organisers. The British section, running to 250 pictures, is undoubtedly the finest collection of professional portraiture which has ever been brought together, and, moreover, includes work by notable photographers who have not previously been seen in these shows. The technical and commercial section, although not large, contains a considerable variety of work serving to emphasise the importance and high standard of quality attaching to this branch of photography. Notable in it are the copies of paintings by Henry Dixon & Son and William E. Gray; architecture by R. G. Randall and E. J. F. Wilkinson; engineering subjects by Charles F. Dickinson; motor cars and other subjects by F. Wakefield, and photographs of wireless apparatus by D. Charles. There is also a small press section of approximately current news photographs, which, at any rate, serves to bring to notice the important part which news photography occupies in modern journalism.

In the foreign section of professional portraiture perhaps the exhibit which artistically is of the greatest interest is that of Emilio Sommariva. The French and Belgian division exhibits marvellously fine technique in many instances, particularly the prints by M. P. Apers, of Paris, himself a visitor to the Congress. The United States sends a very large section, and that contributed by Scandinavian photographers contains the work of leaders, such as Dr. Henry B. Goodwin and F. Flodin, both of whom are personally known to many photographers in this country.

Following the official opening of the Congress by Mr. Swan Watson, some interesting speeches, which we report below, were delivered by the delegates from Canada and the United States, Messrs. Kennedy and Aylett, from Toronto, and Mr. Pirie Macdonald, from New York. The president, in his address, drew a series of lessons from the works of great painters to be seen in our own and the Continental galleries, particularly in reference to the preference for the habitual instead of the passing expression in a sitter as a means of satisfactory likeness. He also referred to the absence of a positive smile in portraits of children by the great Masters, and further illustrated the different types of lighting, including some which are often thought to be quite recent discoveries, which are to be found in the portraits by the great painters.

As is shown from the programme, which has already been published, Congress members may have the busiest of weeks, if they take advantage of all the fixtures which have been provided. Many, no doubt, will choose here and there and combine the items which specially interest them with visits to the manufacturers' exhibits and to non-photographic recreation in London. The studios of the following photographers are being visited by courteous permission of the proprietors: Madame Yevonde, Messrs. Arthur Banfield, Angus Basil, Alexander Corbett, Reginald Haines, Lafayette, Ltd., Hana Studios, Ltd., and J. Russell & Sons. By the time the present issue is published the Congress will have almost come to its conclusion, so that reports of the lectures and meetings figuring in the latter part of it must be held over for appearance next week.

The following awards were made by the judges, the Earl of Carnarvon and Messrs. Furley Lewis, J. B. B. Wellington and H. W. Bennett:

British: Silver gilt—"Master of the Hounds" (No. 237), by Messdames Morter; Silver—"Punkey" (No. 164), by Herbert Lambert; Bronze—"Well known in our Village" (No. 181), by Miss Daisy Day. Foreign (excluding British Dominions and United States): Silver gilt—no award. Silver—Study (No. 449a) by M. Dante. Bronze—No. 471, by Shaun Wyndham.

Canada: Silver gilt—no award. Bronze—No. 725, by John Kennedy.

United States: Silver gilt—No. 591, by Richard Dooner. Bronze—No. 750, by J. Vanderpant.

Commercial: Bronze—Copy of painting "The Strawberry Girl," by Reynolds (No. 279), by William E. Gray.

Press: Silver medal—Princess Mary's Wedding (No. 254), by the "Daily Mail."

A special award of a silver medal was made by the judges to Signore Emilio Sommariva, of Milan, for the series of portraits (Nos. 313-343).

OPENING OF CONGRESS AND EXHIBITION.

The official opening of the International Exhibition took place at noon on Monday, September 11. The Right Hon. the Earl of Carnarvon was accompanied on the platform by Mr. Swan Watson (President of the Association), Mr. Alexander Corbett, and Mr. R. N. Speaight.

The Earl of Carnarvon said: It is with a little diffidence that I am here to-day to open this very important Exhibition. I had hoped to have seen a very distinguished person occupying this place. He would have been far better fitted than I am to perform the task assigned to me, although perhaps he might not have known as much about photography, for it has been a hobby of mine for many years. But, as you are aware, many people whom we should have liked to have had with us are away from London at this time of year, and therefore I hope you will be satisfied with me as a poor substitute.

For many years, ever since I was a boy at school, I have followed photography with keen interest. I well remember being given a small camera which contained a sensitising bath and everything complete. I cannot say that the results were very marvellous; certainly they would not rank with anything at all produced to-day, but to my youthful imagination they were perfectly enchanting. There have been more epochs than one in the history of photography since those days. One epoch was signalised by the introduction of dry plates, which made photography easier, simpler, and cleaner than it had ever been before. Another was marked by the advent of the Kodak and films, which made photography possible to everybody. And there has been a third period, during which the original ideal of pin-point sharpness, of painfully accurate reproduction, has been departed from, alike in landscapes and portraits, and we have arrived at a more artistic conception. From a glance at these exhibits I think you will gather that in this direction modern photography has made enormous strides. No longer have we the hard, matter-of-fact reproduction of years ago, but there is evidence of a genuine effort to produce something which pleases and which evidences the personal feeling of the producer and his taste in selection.

But I must not be led away by personal recollections, for I want to say a few words about this Association. Originally it was started by five leading photographers—I think in London—and I am glad to say that some of the five are present here to-day. Well, the Association grew and grew, and although for a period it did not grow perhaps quite as quickly as might have been desired, it has now reached a membership of over 1,200. I think that a great debt of gratitude is due to those original five. If it had not been for them it is possible that the movement would not have started, at all events it would not have started so soon. But the puny infant is now a strong man. Amongst the objects of the Association the protection of the photographer remains always paramount. It is ready also to assist all photographers. It is not an association merely for the benefit of Bond Street photographers—by which I do not mean that all the leading photographers belong to Bond Street, but the expression stands for the photographers who are at the tip-top—but it is ready to help even the gentleman who stands on the beach, armed with a sort of cannon, and photographs you for twopence, frame included! Unlike a great many associations, this one really does very hard work. The Council meets once a month, and sometimes sits for four hours. Its enterprise has been illustrated lately by its publication of a magazine. I feel that every support ought to be given to the Association by professional photographers. When you get a very large number of people of a single trade or profession banded together it is probable that their interests will be very well looked after.

As regards the Exhibition to-day, I dare not say very much, except that the examples are remarkably fine. What is perhaps a striking point is that while the Association has previously held exhibitions, this is the first International Exhibition on which it has ventured. We have exhibits here from practically all the countries of Europe, and from America and the Dominions. I do not think there could have been such a representative collection had it not been for the kindly offices of the Ambassadors in this and other countries. In the room in which we are met all the exhibits are British, and I think we may say that the British compares very well with the other sections. That must be a source of satisfaction to everybody here. Besides the exhibition on the walls, there is in the next room a trade exhibition, where you will find all the latest adjuncts necessary to the photographic art. The only thing I should like to add is that the best thanks of everybody are due to the committee which has had charge of the selection and hanging. They have done their work most excellently. I now declare the Exhibition open.

Mr. R. N. Speaight proposed a hearty vote of thanks to Lord Carnarvon for his kindness in opening the Exhibition. He had honoured the professional photographers, not only of Great Britain, but of all countries. Many thanks were due, as his Lordship had said, to the Ambassadors and Ministers resident in this country, and also to the secretaries of photographic societies abroad. The Earl had referred to the Association as now a fully grown man. Certainly it had reached its twenty-first birthday, but in the eyes of many people it was not yet old enough to walk alone, and there was considerable uncertainty when it started its steps this year without a guiding hand. He would not say that it had learned to walk, but certainly it had learned to stand alone, and if the present Exhibition proved the success it promised to be, they could look forward to far bigger things in the future. They were indebted to Lord Carnarvon for acting as one of the judges, and he hoped that when the time came for the pictures to be returned, a *résumé* of his Lordship's remarks would be sent with them, for that would do much to help professional photography forward.

Mr. Pirie Macdonald seconded the vote of thanks, on behalf of the newly-affiliated Professional Photographers' Society of America and also on behalf of the Canadian brethren. The Exhibition was part of the grand scheme which was in course of development to unite the English-speaking peoples of the world. The Exhibition was going to do much to make the American photographer feel that he was a part of that great united body which was going to carry a genuine civilisation throughout the world. They in America had a feeling of intense cordiality for Great Britain, in token of which he had been sent there as delegate. The invitation to America to exhibit in this British show was a sign that the British wanted the Americans to walk with them along the same road.

The vote of thanks was carried in Scottish fashion with three vigorous hand-clappings, and Lord Carnarvon, in acknowledgment, said that he was always ready in whatever small way he could to help the Association.

THE PRESIDENT'S WELCOME AND RECEPTION OF DELEGATES.

Addressing the members on Monday evening, the President, Mr. Swan Watson said:—It is my great pleasure to welcome you to the 1922 Congress of the Professional Photographers' Association of Great Britain and Ireland.

It is our twenty-first birthday—no ordinary occasion. Twenty-first birthdays are usually associated with newness of life and freshness of hope; the past has been our childhood, our training: it will soon be forgotten; the future opens out with widening possibilities.

Twenty-first birthdays are usually associated with congratulations. Here let me record:—From Rome, the Eternal City, Signore Bettini, Signore Bonaventura, and Cav. Felici send you their salutations. The same exultant spirit comes from Signore Socci of Florence, principal of the world-famed house of Alinari.

From Paris—Messieurs Benjamin, Manuel, Melcy, Nadar, and Reutlinger send you greetings and congratulations.

Ferdinand Flodin, of Stockholm, writes: "I regret exceed-

ingly not to be able to be present at your Congress, but extend to you, as its representative, my heartfelt wishes for a successful time." Dr. Goodwin, of the same Northern capital, wishes you a joyful time.

From our sister country, America, J. C. Abel—a photographic power in the United States—writes: "I wish you the very greatest success with your coming Congress, and I trust that the visit of Pirie Macdonald and the exhibition of American work alongside the British work will help to cement the friendly relations between our countries still further. Kindly extend to your members my very best wishes and expressions of goodwill, and tell them we shall certainly look for some of them over here next year and another great collection of British work." With such good wishes pursuing us, my friends, we ought to be happy.

On twenty-first birthdays we don't say much about the past. It is the future we look to. We could not have been without the past, and the year that is gone is perhaps a memorable one. I do not want to trespass on the Secretary's report, but two things stand out. The Association has become an incorporated society, with all the prestige of such a body, and last year was the genesis of our own journal—"The Record of Photography"—a magazine destined to help its professionals.

The future of professional photography to me has never seemed so great, notwithstanding that I am fully conscious of the great industrial unrest and lack of business. A professor of medicine said to me that every text-book of medicine that was ten years old was out of date. Photography is in much the same position.

Only, let us remember, let the younger generation be taught: we must keep moving, and it is this that will create respect for our profession. The future photographer must be well educated. If he can go to the university and take a degree before he starts, including in his subjects psychology, fine art, chemistry, light and optics, he will be a better photographer. Some artists are now doing this.

We cannot all do this, especially we who have just turned our twentieth year, but we can keep our ears close to the ground, our intellect continually on the alert and active, and our spare moments—if we have any—to the widening of our knowledge.

Last year has brought the Association the service of a secretary who devotes his whole time to its interest. Mr. Alfred Ellis is a gentleman of wide experience and of great worldly wisdom. What he does not know about the photographer's interests is not worth knowing.

The President's address was preceded by the introduction of guests from overseas in the persons of Mr. J. Kennedy and Mr. Charles Aylett, both of Toronto, and Mr. Pirie Macdonald, of the United States. An effective musical programme was arranged, whereby "The Maple Leaf" was sung in honour of the Canadians, and "My Country, 'tis of Thee," in honour of of the American. When, later, Mr. Pirie Macdonald handed a beautiful American flag into the custody of the Association "The Star-Spangled Banner" was sung.

Mr. Kennedy thanked the members for the reception accorded to him and his colleague. The Canadian delegation consisted of Mr. Aylett and himself and their ladies. It was not the fault of Mr. Reginald Haines that it did not consist of twenty-five or more, but the distance was great, and some were too busy to come, and the finances of others would not permit of it. In Canada they were told that London photographers were rather high and mighty people, but he and Mr. Aylett had found themselves quite at home. Their visit was the direct result of coming into contact with that "genial, chubby little member of the Council," Mr. Haines, who made many friends in America and Canada. During their visit to this country Mr. Haines also had acted as a delightful host, showing them everything in London that was worth seeing, and motoring them many miles in the country. They felt amply repaid for their visit already by seeing the beautiful work on the walls of the exhibition. He had attended American conventions for rather more than twenty-five years, and had never seen such a beautiful collection of professional work, though he had seen larger collections, for in America they were accustomed to "miles of it." He added a few words in appreciation of Mr. Macdonald, who, he said, had a genuine love of England, and did not "put it on" when he came over here. In fostering British sentiment in America during the war Mr. Macdonald had done a great work.

Mr. Aylett also expressed his gratitude for the reception which the Canadian visitors had been accorded, and brought the greetings of the Ontario Society of Photographers. He had already learnt so much from his stay in England that he wanted to get back and do some work. Rupert Brooke had said of England, that it was a land from which men of splendid hearts went out, but he thought it was a land where men of splendid hearts remained all the time.

Mr. Pirie Macdonald began by saying that he was not a bit nervous. The honour that had been done him was quite of a piece with all that he had been accustomed to expect from Englishmen. He had, nevertheless, a tremendous responsibility. It was seldom that a man had the opportunity of representing an association of two thousand people. He went on to refer to the feeling in America during the early part of the war. He himself was the son of a British father and a British mother, and fifty years ago, at the time he was a youngster, to live in the United States was not an easy thing for a person who spoke the English language with the clarity with which they were accustomed to speak it, as compared with the jargon of the American mob. He was made the mark of many a missile, and he had to fight his way through in some communities that were at that time full of hatred against England. He got through, not maimed at all, either in body or spirit. During the last fifty years there had been the inevitable growing together of a thing which was naturally one. During the war, in a profession which was made up of a large proportion of Germans—half of them perhaps of German birth—they arrived at any rate at a point where they were fifty per cent. for Britain. He himself paid no attention to a man's birth when he spoke during the war. He toured the country from one end to the other, spending thousands of dollars and many sleepless nights, in his effort to point out what to him was the only course for Americans to pursue.

Britons and Americans had the same language, and even among the Germans in America, in the second generation, they had learned to speak in English and not in German. Therefore they thought in English, and English had not that quality of elision, whereby some words might sound like one thing and mean quite another. The basis of the common life of both the British and the American people was the law that was started in their hearts even before the Magna Charta. It meant that these two peoples had the same sentiments regarding justice, the same ideas as to the separation of right from wrong. During the fifty years of which he had spoken, one veil after another had been lifted. There were other veils which still remained, but they too in time would be lifted. Destiny was a word to play with. It was used alike by the Bohemian and the "high-brow," each to his own purpose. But there was something in the word. It meant the end to which they must travel. Destiny was not something ready made; it was something they made for themselves. Destiny was always the child of desire. He had a feeling that there was a destiny for these two nations if they desired it—that is to say, if the individuals composing them desired it. For his own part, he desired above all things the unity of the English-speaking peoples of the world. If that was the desire of those to whom he spoke, there was a work which every one of them could do to bring it about.

Mr. Macdonald added that when the extension of the affiliated membership was made, so that each member of the Professional Photographers' Association in Great Britain was automatically made a member of the Photographers' Association of America, there came a feeling that there ought to be, in

British hands, a symbol whereby the friends on this side of the water might visualise the friends on the other. They had, therefore, sent by his hands their most revered emblem—a thing which occupied in their hearts the same place of reverence as the Union Jack in the hearts of the people of this country.

A large and beautiful example of the Stars and Stripes was then unfolded, amid loud applause, all those present standing.

Mr. Reginald Haines asked Mr. Macdonald to accept the thanks of the Association for this beautiful gift. The flag was beautifully wrought in itself, and yet far more beautiful because of the sentiment which clung to it. When, last year, he had the honour of conveying the Union Jack to Buffalo, he little thought that from so small a beginning, and with so insignificant an instrument, there would result such a thing as the presence of these overseas visitors at their own Congress. It was a great honour to have with them three men who had travelled over 7,000 miles to be present. He recited some of the memories of "Old Glory," which bound the American people together. There was no man they were better pleased to see on this side than Mr. Pirie Macdonald. He had won a foremost position, not only by his photographic work, but also by his virility, his personal magnetism, and his singular capacity for inspiring the people with whom he came in contact, whether on one side of the Atlantic or the other. The Americans believed that it was very necessary "to know the other man." He wished that that feeling, so evident at Buffalo, could be transplanted here. Both he and Mr. Macdonald happened to belong to a brotherhood—the Rotary Fellowship—one of whose leading ideas was fellowship not only between nations, but between men.

The President welcomed a French visitor, M. Apers, who was among them, and in a few words, spoken in French, M. Apers spoke of his enthusiastic admiration for the pictures exhibited, and his pleasure at being among British photographers.

Mr. Frank Brown then called upon the President to deliver his address from the Chair. Mr. Swan Watson, he said, was happy in his year of office by reason of the immense success of the Exhibition, and the presence of so many distinguished visitors.

The President prefaced his address with the remark that it was usual on a twenty-first birthday to bring gifts, and he would respectfully suggest that a very appropriate gift from the members to the Association would be for each of them to make his subscription a guinea instead of half a guinea. At the close of the addresss Mr. Frank Brown moved a hearty vote of thanks, which was seconded by Mr. Alexander Corbett, and carried with the singing of "For he's a jolly good fellow."

SOME EUROPEAN PORTRAITS WITH SOME TENDENCIES IN MODERN PORTRAITURE BY PHOTOGRAPHY.

For the rest of the evening, as most of us are engaged in portrait photography, I propose to show you some portraits by European artists. Afterwards I hope to show you some modern portraits by foreign photographers.

It seems to me, generally speaking, that the majority of painters have adopted one of two forms of lighting their portraits. First, they have placed their sitters where the shadow side of the face is furthest from them, the light being directed from the top and slightly from one side. This lighting, known as the 45 angle, is by far the most common and, in the majority of cases, gives the surest likeness. From the days that Cimabue painted his Madonna, Macassio his Adam and Eve, and Botticelli his Venus, down to the latest Academician, this has been the favourite light. In my judgment it is the first we ought to teach apprentices. When they have mastered this they can experiment with shadow lighting, always keeping likeness in their mind. It gives the centre of the face in light, the further side in shadow, and the side nearest the light just a little lower in tone than the centre of the face. Famous portraits are typical examples, e.g., Leonardo Da Vinci, that famous painter, chemist, poet, engineer, and wizard, by his own brush; Michael Angelo, the architect of the dome of St. Peter's at Rome, the painter of the Sistine Chapel, and noted sculptor, by his own brush; Angelo Doni, friend of Raphael, the same lighting, but a lighter background; Fornarina, the girl that Raphael loved.

Coming down the centuries into France, there is the portrait of Marie Antoinette by that gifted French artist Madame Vigée le Brun, note the pose of the hands, the line of the dress; the daughter of Vigée le Brun; Napoleon, by Delaroche, in which the position of the right arm and the downward pose of head and expression are to be noted. Then there are Nattier's Madame Henriette de France and our own George Frederick Watts, by himself.

The second form of lighting that artists have used extensively is that of painting the face with the shadow side nearest the painter. The principal light is directed from behind the sitter, with a subsidiary light in front. This means that the principal light is more or less on the outline, furthest from the painter. This lighting has been extremely popular through the centuries. It gives more light and shade, and perhaps more roundness. The early photographers erred on the side of too much shadow. This kind of lighting seems to be on the wane, both with painters and photographers. I may refer to the famous picture of Beatrice Cenci from the Barberini Palace, Rome, by Guido Reni; to Marco Polo, by Titian; to Raphael's Pope Julius, that terrific warrior Pope. In this portrait the eye is looking further down than the spectator; not many photographs are taken like that. In the portrait of Madame de Pompadour, by La Tour, you should notice the lowness of the point of view of the painter (or, as we should say, the camera), much below the face; also the leaves of the music, the arrangement of the articles on the table, the books at the foot of the table, and lastly the feet. Would you have posed them thus? Other examples of this lighting are Dr. Schomberg, by Gainsborough, in Tate Gallery, and Mrs. Siddons, by Sir Thomas Lawrence.

While most portraits throughout the centuries have been painted on these lines, there are one or two other systems which have been adopted by individual artists. There is a kind of lighting which is mostly from the top. As typical examples, perhaps the eminent scientists, Darwin and Huxley, may be cited. They are painted by the Hon. John Collier. This kind of lighting puts a certain amount of shadow on the whole face, and has a tendency to give a sense of gravity to the expression.

That great master of light and shade, Rembrandt, had methods all his own. To him shadow was of infinitely more value than light. In many of the portraits, which I have personally studied in the galleries on the Continent, I find that only about one-twelfth of the picture is in light; the other eleven-twelfths is in mystic shadow.

Notable examples of Rembrandt's art are the portrait of himself, from the Berlin Museum; the portrait of Sobieski; and Rembrandt, from the Louvre.

This form of lighting gives great strength of character, and it seems to me that just in proportion as shadow in daily life leaves its mark upon us more than success, so I think these portraits are more likely to outlive the changing fashions of lighter pictures or fancy lightings.

The kind of lighting in his Jewish Rabbi is possibly not suited for children. Many a time have I looked in the galleries for a child by Rembrandt, but have never found one. Even his young bride Saskia, and his girl with the broom are treated to shadow. It may be noted that he seldom lets any light run out of his picture.

His "The Syndicate of the Drapers," from the Rvks Museum, Amsterdam, taught me the value of a thick tapestry cloth. You get magnificent folds.

Poor Rembrandt! He knew what success was, even to overflowing. He also knew, at the last, the bitterness of failure. But these three hundred years have not diminished his power. To us he stands as a living inspiration. All his forms of lighting in his portraits are possible in photography. Remember, too, he knew nothing of the powers of electric light.

There is another kind of lighting found in some portraits in the galleries, which is charmingly elusive. It is, perhaps, an effect of lighting rather than a particular form. I refer to that kind of lighting in which one part of the face is thrown into shadow by hat or hand.

In the La Femme au Chapeau de Paille, by Peter Paul Reubens, the light is simply delightful, but difficult to do in photography. Note the light is on the shadow side of the cheek, an anticipation of spot lighting three hundred years ago; note it is all daylight.

The portrait of Madame Vigée le Brun, in the National Gallery, painted by herself, inspired by the last picture which she saw at Antwerp. It was she who said "To *paint* and to *live* are the same word to me." How many photographers present could paraphrase that?

In Sir Joshua Reynolds' portrait of himself, in the National Portrait Gallery, you should look at the soft shadow below the hand and on the light side of cheek.

Another portrait in the National Portrait Gallery, that of Thomas Philip, R.A., painted by himself 120 years ago (1802), there is a side light that is now fairly often seen in American portraits by photography. Last year I listened to an eminent photographer, who looking at one of these American portraits exclaimed: "Search all the European galleries and you will not find a light like that on any portrait."

To turn to modern portraiture. Sir William Orpen has painted some portraits in what may be termed a new kind of lighting, and, of course, he has been copied. But oh! how far superior is the master's touch. It is somewhat the same—though not quite the same—as what has become known in photography as spot lighting. It is that of a concentrated light being directed on to a particular part of the face, generally more definite than reflected light, generally too—though not always—on the shadow side. It is not intended to compete with the principal light, but in photography it often does. Sir William Orpen has courteously granted me permission to show you his portrait of Earl Haig.

Later I shall show you some examples of portraiture by photography in this light. Artificial lighting has given much power into the hands of the photographer, but I am not certain that it has given more powers of likeness. Said a Continental photographer to me: "Bring me any portrait from the galleries and I will light one in my studio the same." How many photographers could do that—or would even try—yet I believe this man could.

In the Pitti Gallery at Florence there are four rooms devoted to the portraits of artists. For the most part these are by the painters themselves. Here hang Michael Angelo, Leonardo, Titian, Raphael, Rubens, down to our own day—Millais, Watts, and Sargent. Many a time I have looked at these and wondered what some of these men were thinking about.

On re-visiting this gallery recently, what impressed me most was that on none of those faces was what might be called the "momentary" or "passing expression," produced by some thought entering the mind suddenly and illuminating the face. But in all those faces the expression was one which gave the impression of years of thought—that which made the character what it was.

Coming from the Pitti to the Louvre Gallery, and looking at four portraits of Rembrandt by himself, I found no hint of a thought created a minute before, but, on the faces, the fundamentals of the mind. At times it was a bit of biography; at other times a bit of history. How comes it that these painters chose to paint themselves so? Surely they must have thought the "habitual" was greater than the "passing."

The conviction has been growing upon me that we photographers have erred in aiming at the passing. Have we been endeavouring to get the "momentary" rather than the "habitual." I am disposed to think as a man advances in years, if he is a man of character, that we should give longer exposure and endeavour to get portrayed something of the inner man's mind, which cannot be got by an instantaneous exposure.

Take the instance of a young man. A marvellous change has come over these last years. No portrait of an immaculate Apollo with an irresistable expression is now wanted, but something learned, distinguished, brainy. A touch of ruggedness or severity in most instances will increase your order.

In consternation, one of my young lady assistants told me that there was a young man in who wanted to be taken like Oliver Cromwell. When he entered the studio I asked which portrait. Blushing slightly, he said, "I only don't want my warts removed."

The young lady, too, is now inclining to want a picture "just of herself," not a modernised Juno.

Babies, however, are different; they have comparatively little mind or character. They require to be taken more quickly; besides they may move.

One singular fact is that in examining the paintings of children in the principal galleries of Europe, I do not know of a single instance of a child painted smiling. One does get them interested with that interest that speaks of dawning intelligence, and this is almost divine. Even in the cherubs of Titian—Andrea del Sarto—there is no smile.

In the pictures which I now show I invite you to ask yourself whether the prevailing expression is the transitory one, which might fade before the exposure was over, or is it the habitual. These are Mona Lisa, by Leonardo da Vinci; Rembrandt, from Louvre; Titian; Philippino Lippi.

One morning last year I received a strange invitation—would I go and give an illustrated lecture to 150 men in gaol? Hesitatingly I replied that I doubted if anything I could say or show would interest them. The gentleman thought differently, and reminded me that I would be addressing, among others, some very well educated, and some quite as clever as myself. There was no room to doubt the latter remark, so I went. It was a strange experience, but it left me this impression among many others, that it was the habitual that was the true likeness of the man. The Governor paid me a great compliment on the impression I had made; this I took with the usual "cum grano salis."

In less than a week I was invited to another prison, to give the same lecture, this time to men and women. I went willingly to study the expressions. Again I scanned the faces, asking myself what was the true likeness of these people. Again I came to the conclusion it was the habitual, not the passing.

Here let me introduce to you, illustrating character and long exposure, a group. This had an exposure of two and a-half minutes, and here are two of D. O. Hill, who is reported to have given three minutes' exposure in the sun.

Close akin to the matter of expression is the question—Is it the regular or the irregular in features that gives the character? Most people would answer it is the regular—but is it?

We have all been trained, and have trained our apprentices, to take what was the best side of a man's face. If he had a small eye—put it into shadow. Had he a crooked nose—take the side that shows it least. Did his mouth run up at one side more than the other—to be sure and avoid that side, and so on; so we acted and so we taught.

But I have convinced myself recently that if you take a portrait of a man at what one calls popularly his best side

and one from the other side, and submit two proofs, very often he will order from the wrong-side portrait, for his friends think it is most like him.

A client of mine, some time ago, received three proofs, ordered a dozen each from two of the three negatives and took the third proof somewhat hesitatingly. In less than eleven months a repeat order was given for two dozen more, but from the one that only one copy was taken from; it was—we shall call it the wrong side. A month later the father of the man called and ordered twelve enlargements—quite a tidy order. This, of course, is an isolated case, but I have frequently this experience in a smaller degree.

Here I may refer to the portrait of Coventry Patmore, by Sargent, in the National Portrait Gallery. To look at it most of us would say that the defective eye is towards the light, yet the artist chose that side.

There is a story that Vandyke is said to have painted King Charles—who had only one eye—in profile. The picture was not considered a success. Then he painted him showing the defective eye, and every one said it was excellent likeness If it is a true story it illustrates my point.

Now I will show a few portraits and raise some questions about them.

Portrait of Nell Gwynn, by Sir Peter Lely. Is it ever successful in portraiture by photography to turn the head away from the camera and then turn the eyes back. One does it while listening, but in photography does it not look a little sly?

Here is a portrait of Henry James, the novelist. I would like you to look at it from two points. First there is a theory taught in art schools that there should either be one light in a half-length picture or three lights, one principal and the other two subordinate. Here there are only two—does the picture satisfy you. Note the position of the head on the canvas; if anything it seems low.

Now note the portrait of Sir Henry Taylor, by G. F. Watts. The head is placed much higher than the last; in fact, a little of the hair is actually cut off. Are both pictures right? In looking at a half-length of a man, can you tell me whether he is a tall or short man? The director of the Scottish National Galleries thought it was impossible. But is it?

Let me show you four pictures by the Spanish painter Velasquez. He has much to say to photographers. Here is Pope Innocent X., from the Doria Gallery, Rome. A celebrated Scotch portrait painter told me that he regarded this as one of the masterpieces of the world. When I saw it I agreed with him. Suppose a photographer takes a man with an expression like this—there is nothing to prevent it—will that picture retain its interest as long as this?

Here is Æsop with his book of fairy tales. Look at the attitude; look at the lighting; look at the expression. I cannot quite understand why Velasquez seems to emphasise the feet so often.

Here is Menippus, a wonderful drawing. Few of us photographers can take full lengths of men and abstain from weakness.

Here is the Spanish admiral, Pulido-Pareja, from the National Gallery. Observe the shadow cast from the figure.

Few painters repay the study of the photographer more than our Scotchman, our own Edinburgh man, Raeburn. Here is the portrait of the good man himself. Could you desire any photograph better? Look at the dignity. Look how nicely the left hand at the chin is shaded, though it is turned to the light.

Here is Lord Newton, Scotch judge. Look at the strength; note how the lower part of the figure is shadowed. Is that expression a passing one or the habitual one? A well-executed copy hangs in my home; though severe, I joy to live with it.

Few men would care to go down to posterity in red cap and dressing gown, but Professor Robison was a man of science, connected with our university, where this portrait hangs. Observe the placing of the figure, not the general rule, that you should have more room to front of the face than behind. Note the pose and shadowing of right hand.

MacDonnell of Glengarry, a Highland chief in his ancestral hall. Note the lighting, the shadow on the background, the light on the knee—the strongest in the picture—the expression of the mouth. You need not try to put your salmon rod upon the Garry without permission.

The Macnab, Chief of the Clan. Observe the placing of the figure—the distance this time in front of the figure, the height the camera would have been if it had been a photograph. The light on the leg is again strong. What character on the face! Is that a passing or habitual expression? You need not go on taking an odd shot at a grouse here, or his gillies will run you down.

Ladies and Gentlemen, I love these men; they are true Scots, with all their national instinct. I wish they had been my ancestors.

Robert Louis Stevenson, in his "Virginibus Purisque," thinks that Raeburn's women have not the same marks of character. There is a certain truth in this; still, it cannot be said of them all; a few of them could sum up most men.

We, as photographers, must act much quicker than painters. We have to sum up our subject, decide on the scheme—keeping, if possible the finished portrait in our mind—and photograph our client all in less time than the painter has for his first sitting. If, however, we reverently study how the painter arrives at his finished picture, the spirit of the painter may exchange with the spirit of the photographer, and each to the other's gain.

I now desire to show you a few modern portraits by photography by other than British photographers.

There are a few general tendencies in modern portraiture, not only in this country, not only in America, but in the nations of Europe. These indicate an activity of mental outlook for which there is nothing but praise.

They seem to be eccentricity or affectation—and so they may be to some—but they also may be the beginnings of some new aspect of truth. History is full of instances of heterodoxy in one age becoming the confirmed orthodox belief of the next, so that it behoves us to look at these new things with the open mind.

1. The first tendency is to try other methods of lighting than the more traditional ones.
2. To get away from the irritating detail which photography can so easily give.
3. To use reflected light, not as a softener to shadow, but as a subsidiary light.
4. The use of spot light.
5. To desire to avoid extreme sharpness in portraits, to portray more the mental likeness than the visual one.

Nathaniel Hawthorne, in 1858, records the remarkable story of a meeting with Browning in Florence. Browning spoke most rapturously of a portrait of Mrs. Browning which an Italian artist was painting for an American gentleman as a present to his wife. The success was perfect in two sittings. Browning had sat seventy-three times to an American painter. In the result every hair and speck was represented, yet this accumulation of minute truths did not, after all, amount to the true whole.

It was only an impression, yet Browning was more satisfied with this mental impression than with a visual one. When I chose my subject I had no idea that the Council would be so fortunate as to have a special lecture from Mr. Aylett on unusual light and soft focus.

Signore Bettini, of Rome, is an original worker. No photographs are just like his. Look at the lighting of these five portraits. Look at the light, the pose and background.

Signore Bonaventura, also from the Eternal City, works on different lines. He loves the mystery of shadow. He is one of Italy's forward workers.

Signore Socci is the principal of the house of Alinari, the house of technical excellence.

Here is a picture by the celebrated Vienna photographer, A. M. Scheim, and I also show some examples of the famous Berlin photographer, Nicola Perscheid. I here bear testimony to the unfailing courtesy with which all these gentlemen have acceded to my request to send me examples of their art.

Here is a most interesting subject—a lady taken with a portrait anastigmat lens and the same lady taken with a soft focus lens. Here is the celebrated Danish photographer, Peter Elfelt, of Copenhagen. Note the source of light and the background.

Now here is our old friend, who was at our last Congress and spoke so well, Ferdinand Flodin, of Stockholm, with all his warmth from a cold country. Now let me also show you some portraits by Dr. Goodwin. Those who saw Dr. Goodwin's show at the Royal last spring will not easily forget it. The work shows a great amount of versatility. Here is a head that has the classical spirit and would do credit to the Parthenon.

Now we come to Paris. No city shows more diversity of talent. Here let me say how all so willingly responded to my request for examples of their work. Here is the work of M. Benjamin. How strong it is! Here is the work of M. Meley; note its delicacy. Here is a charmingly posed picture by M. Manuel. Here are some celebrated people by M. Nadar, with a portrait of himself with a special message written on it. Here is the work of M. Reutlinger; how diverse they are, yet all good!

Now when I thought of this talk a couple of months ago I wrote to Mr. J. C. Abel, a power in the American photographic world, and asked if he could get me some examples of spot light and out-of-focus subjects. His response, like himself, was electric. His letter writing, even through the cold medium of ink, and still further cooled by the Atlantic thermometer, was warmth itself. It is a great disappointment not to have him here. He is a big-souled man; how he praised up our friend, Mr. Pirie Macdonald! I will not attempt more than simply to show you these; they illustrate some modern tendencies in portraiture.

The last picture I show you this evening is the portrait of Mr. A. H. Diehl, President of the American P.P.A. I invite you to stand as an indication of your warmth and brotherliness, not only as a token of respect to the gentleman himself, but to the large Society which he represents.

A. Swan Watson.

TRADE EXHIBITS AT THE CONGRESS.

The Akron Manufacturing Co. show specimens of their well-known dry-mounting presses and tissues. A special feature of the Akron press is the ball thrust which allows of easy movement of the pressure wheel. A new press, the "Akron Auxiliary," was demonstrated. This press has a new type of aluminium plate which is open all round, and will mount prints up to 15 × 12 on the ordinary plate-sunk mounts. The pressure is obtained by means of a compound lever acting on a flat spring. A 1,000-ft. roll of Akron dry-mounting tissue was also on view.

Messrs. Elliott & Sons, Ltd., made a special show of their new "Matt-Emulsion" plate. Negatives by prominent workers were arranged in cases illuminated by reflected light. Prints and enlargements from these negatives were upon the walls. The high quality of the enlargements clearly demonstrated the possibilities of the plate for this class of work. All prints and enlargements were upon "Verona," the Barnet warm black developing paper.

Messrs. Bartons' showed mounts and mounting papers in an unusually large and good variety. A new range of art boards were on view, in many surfaces and colours. Photo cases and folders were shown, especially appealing to the American market. Quadro frames were also prominent in brown, black, grey and gilt. This frame is inexpensive, and shows a high standard of artistic merit.

The old-established firm of S. H. Fry showed some exceedingly fine examples of trade enlarging. A wall panel was arranged with enlargements and prints of prominent personages.

The "Stipwell Retoucher" was a prominent feature at Messrs. Houghtons' stand. This retoucher is non-mechanical, and enables the worker to put his own personal control into the work. The "Stipwell" uses the ordinary pencil, to which a metal cap is affixed and attached to the end of a vibrating wire. The electrical vibrator is operated by a wet battery giving only 2½ volts. It is only necessary to guide the pencil over the work, the stipple effect being given by the vibrator. This prevents excessive exertion, and minimises retoucher's cramp. The price of the machine, viz., £5 complete, including battery and pencil, seems very reasonable for an efficient article. The upkeep of the Stipwell retoucher is said not to exceed 5s. per annum. The speed at which negative retouching by aid of this adjunct is possible, is very noticeable, the work in hand being completed in one-third of the usual time taken. Messrs. Houghtons, Ltd., were also showing an excellent range of mounts and albums, including the new architectural mount, and also a large display of dealers' utensils, demonstrating the wholesale capacity of the firm.

A new portrait paper was shown by Kappa Works, Ltd., and excellent prints, demonstrating the possibilities of this printing medium, were shown. Kappa is a developing paper with the speed of bromide, but the latitude of gaslight papers; no special developer is needed to obtain the warm, black tones; each worker using his own pet formula. This paper will be ready immediately after the Exhibition closes.

Kodak, Ltd., were showing portraits, by well-known professionals, on Kodak portrait film, and printed on "Etching Brown" paper. Film accessories and tanks were on view, and a well-made teak tank holding 18 half-plate or 16 1/1 plate films was shown. Visitors were recommended to call at Kodak House, Kingsway, where all the firm's specialties are being demonstrated.

Prints on Vitégas 7a cream and Vitégas Plat 12a were exhibited by Kosmos Photographics, Ltd. The latter paper has a true platinum effect, and the surface will take water colours. Novex plates were shown, and specimen negatives by prominent workers were on view. Prints upon the Kosmos collodion printing out paper were also shown.

At the stand of Peerless Photo Paper Co., Ltd., prints upon the special Peerless chloride paper were exhibited. This paper is eminently suitable for portraiture, the warm, black tone suiting the present-day style of work. The exhibited prints demonstrated the claim put forward by this firm in the direction of depth and luminosity of the shadows. Prints by a new colour process, in which no special alteration to camera or use of filters is necessary, were shown, the colour rendering being remarkable. This process has not yet been placed upon the market, but it is hoped soon to complete the necessary details.

The specialty of Mr. Dixon Scott's establishment is high-class enlarging and printing for the professional. Excellent specimens of this class of work were shown, and clearly demonstrated the personal attention which is given to all studio orders. Other departments catered for by this firm are commercial and ordinary developing and printing work.

Prominent amongst the exhibits of Wellington and Ward, Ltd., was the new "Q tone" paper and developer. The prints on this paper are of a beautiful warm black colour. The "Q tone" developer is now available for professional workers, being put up in cartons containing sufficient chemicals to make 84 ozs. of working strength developer. Prints and enlargements on all grades of Wellington papers were shown. A

separate stand was occupied with "Seltona" prints, and some fine results were shown, a large print showing the possibilities of double-toning by aid of a salt bath.

Mounts and albums were a specialty of Messrs. Witt and Westley's display. Hand-polished frames, of excellent quality and workmanship, were shown, the inlaid work being especially well done. Loose leaf albums, specimens of art boards and the "Weslem" dry mounting tissue were also on view. A notable feature of the stand was the panelled walls, with doors fitted, allowing the display of prints on three different surfaces.

Messrs. Chas. Zimmerman and Co. (Photographic), Ltd., showed specimen negatives on Agfa special fast studio plates, 500 H. and D. The possibilities of the Chromo Isolar plate were also demonstrated. The Isolar backing is between the film and the glass, and dissolves out in the developer. Agfa flash powder and lamps, and the one-solution mercuric intensifier were exhibited.

THE EXHIBITION OF THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

In order to print some notice of this exhibition before it closes, we have had to rely upon notes made in the turmoil and disorder of preparation, before the pictures could be identified with their authors in many cases. We saw enough, however, to speak quite confidently in general terms, although references to individual works, or groups of works, will be necessarily somewhat haphazard.

The pre-eminent impression of this show is of its importance and status. After all, the galleries of the Royal Institute of Painters are picture-galleries, and in that respect alone the move from Vincent Square is a circumstance which can claim congratulation. Piccadilly is the place for an exhibition that wishes to make an appeal to the public, whilst Vincent Square could never hope to attract visitors outside the trade. And it is to the outside public that the professional must first and last appeal. The visitor who is interested in the artistic advance of portrait photography will be more embarrassed than pleased with the dealers' stalls erected in the handsome large gallery, but then the exhibition is for the photographers as well as the photographed, and the former derive much help from the trade exhibits.

If only the public can be enticed, in fairly large numbers, to come and see, there can be no doubt that the Professional Photographers' Association will justify the plunge it has taken; if not in immediate profit on the venture, then certainly in the higher status it will gain for its work among people of taste and affluence.

As to the prints displayed there is not a great deal to choose between the exhibition and that of the London Salon, as far as portraiture pure and simple is concerned. For this year's P.P.A. display ranks practically as the Salon show, with a few professional show-cases emptied into it. This seems to argue that the professional's ground is firm, and that he has prospects. It has taken him a long time to come to the conclusion that success means artistic production; but now that he is working and spending money for that idea he may safely indulge in a little optimism. The struggle will be no less keen than of old, of course; but it will give brains and talent an equal chance with capitalised enterprise.

Another question that presents itself is whether this forward movement is likely to be strengthened or weakened by the inclusion of specimens that are not true portraiture. Aeroplane and other commercial photographs have their place, and landscapes may claim a modicum of ground in so far as it sometimes falls to the lot of a photographer to be asked for a view of a park or garden; but the ground is a narrow one. As to the nudes, must we assume that Mr. and Mrs. Park have a profitable clientèle for this genre? It seems to us that it would be expedient in future exhibitions to specialise with severe exclusiveness on likenesses of people's faces and clothed figures as they are likely to be wanted for ordinary purposes; always encouraging, of course, the utmost variety and resource upon legitimate lines. Theatrical work will be prolific enough in these directions, doubtless; but we have not yet got to the pitch of ideality seen in the Folies Bergères in the matter of the feminine *tout ensemble* to make the studies of Mr. and Mrs. Park, beautiful as they are, an adjunct even of theatrical portraiture.

One aim might be to show the resources of the studio equipment in the matter of settings, as G. M. Blake does, in the very happy arrangement of a lady in evening dress who stands in a panelled corner, with a window behind her. Another to show the ordinary sitter that beautiful prints are not necessarily due to beautiful faces, but necessarily to artistic insight of the photographer. People must be consistently taught—it will take years of course—to see the qualities in the treatment of such a head as that sent by Walter Scott, of a young man, which recalls all that is fine in great portraiture—simple lighting, strength of realisation, and personality, or the pictorial charm that mere garments can lend to a work when in good hands, as witness Chas. Borup's girl in a large hat and garments of delicious tones; likewise the furs in C. Wormold's print of a lady so clothed.

The room wherein these things hang is not too large for its purpose, and is beautifully lit. It includes excellent specimens from Lafayette, whose Mrs. Chas. Webb has a striking design, from R. N. Speaight, A. C. Banfield, Angus Basil, Estelle, W. F. Smart, Reginald Haines and others. There is not a single thing in this room that is below the standard of work at an exhibition in Russell Square or Pall Mall.

Other rooms are devoted to foreign countries. We have noted a series of small dark prints with light heads which are effective, but evidently a mannerism of their producer in Italy.

A truly German subject by F. Fiedler is that of a skeleton with its arm round the waist of a semi-nude woman. From Eugene Smith comes the surprise of a portrait of Sir Hy. Irving, seated.

The Dutch selection does not, on the whole, show any very distinctive work, whilst from France the print that pleases us most is a tinted transfer of a nicely posed and placed lady. The effect is very pleasing in this particular example, but others, treated in the same way, show how much of the style depends upon chance for real success. They are by G. L. Manuel Frères. The Swedish show is a good one, and the prints from America include well-known work from Pirie Macdonald and others.

Unfortunately the exhibition is only open for five days, the last being to-day, Friday.

F. C. Tilney.

Stafford Photographic Society.—This society has been re-formed under the presidency of Mr. Sydney T. Davies. Meetings are held every Monday at 5, Foregate Street, commencing at 8 p.m. The secretary is Mr. E. C. G. Webb, 17, Tithe Barn Road, Stafford.

Camera House Journal.—The September issue of Messrs. Butcher's house organ contains particulars of the latest introductions in the shape of home cinema and lantern outfits, and of enlarging lanterns.

PORTRAITURE AT THE LONDON SALON OF PHOTOGRAPHY.

It is probably due to the steady and persistent advance in facilities of all kinds that the general level of photographic prints made with a view to exhibition grows higher year by year. But it is just as evident a fact that the few extraordinarily good things do not get better and better every year; and this is proof that efficient apparatus and material gives everybody a chance, but, of itself, cannot secure the transcendant achievement. Apparatus and materials—largely fool-proof—are developed by the manufacturers to get certain effects, with the result that these various effects are pretty widely adopted, and soon reach the stage of the commonplace. Distinction becomes, therefore, more and more difficult on the technical side; it is, perhaps, only possible on the artistic side.

The general improvement in technique is a blessing in more ways than one; for besides raising the standard of work generally it has discouraged a little the idea that faking is a *sine qua non* of work that claims to be artistic. The Salon exhibition was never so free from faking of all kind, nor so full of beautiful prints "straightly" produced. Distinction to-day lies in the direction of fine design, character, lighting, and convincing realisation—things which cannot be got at the dealers. The struggle now is not for technics but for æsthetics.

On the art side of photographic portraiture there is illimitable room for improvement. A vast number of successful things are still the outcome of lucky chance, of some supreme effort that appears to be incapable of repetition. At any rate, there seems another theory to account for the fact that photographers rarely go consistently on from good to better. Out of an immense quantity of portraits at Pall Mall there are very few of which it can be said that their authors never did a better. But the truth also remains that in the generality there is a sounder, more genuine feeling for art abroad than there used to be.

Here and there one sees distinct evidence that the photographer has been inspired by some art method of expressing the charm of ordinary natural phenomena. The best instance of this is perhaps in "Pamela Smith" (40), by Marcus Adams, where the light and shade are obviously the theme of the design. The thing seems planned just as an eighteenth-century engraver would have planned it, for the beauty of the masses of light and shade as they are relieved upon an open background of sky, a mere strip of foreground affording something for the little maid to stand on. In such works we may assume that the technics of photography are a matter of course; but the art idea is a matter of choice and pursuit. This, by the way, is an entirely different thing from the mere unfeeling mimicry of art methods and media; nor do we imply that artistic photography cannot break its own new ground in the search for beauty that the old art methods could never have arrived at. But the latter kind will belong to the technics of photography rather than to the bulb-presser himself, who can hardly be expected to find new principles of beauty unknown to the artists of the past.

Those who prepare exhibitions have to consider factors which would have no weight in a studio. The whole show has to present a striking and attractive appearance, and this means that large prints get preferential treatment, and a decided look-out is kept for any that "stand out" when on the wall—a qualification which usually boils down to a boldly-marked "pattern" and clean cut relief of light and shade. It is in reality these qualities that we admire in Yvonne Park's "La Boheme" (11), Herbert Lambert's "Dame Ethel Smyth" (96) or H. v. Wadenoyen's "Miss Una O'Connor" (120). In the case of the first and last, the subtle beauty of the faces is scarcely noticed, much less enjoyed, until one has broken away from the masses of black in which they are buried. One certainly cannot see, properly, both these respective parts at the same distance and with the same visual adjustment.

May it not be questioned whether this kind of selection is of any advantage except to "the Gate"? Does it not encourage the manufacture of great, strong, prints that would be almost insufferable on the walls of modern houses? At the Salon the small and delicate things that do happen to be selected are usually placed upon the screens, where they get neither their fair share of light nor attention. There is no denying that the R.W.S. Gallery presents a very distinguished appearance as hung by the London Salon officials, but the fact remains that it is not the best friend to the kind of print that professional photographers sell most of. The worthy officials would perhaps reply that their show is for the amateur pictorialist, but as a matter of fact the visitor will find the exhibits nearly all portraiture, and where the portraits are not by recognised professionals, they are by the amateurs who are graduating for the profession.

The amateur, or the chrysalid professional, as the case may be, nevertheless takes a front-rank place. The names of Mesdames D and R Morter are new to us, and we must assume that as their leading work here is also shown at the P.P.A. exhibition at the R.I., they are not amateurs. In any case, we are glad to congratulate them upon two remarkably successful works. The first is "Master of the Hounds" (2), a lady, in the dress of the chase, and holding a crop in both hands. The pose is very spontaneous, natural and quiet, yet by no means ordinary. A little rakishness is given by the tilt of the hat over one eye. The other work is called "Altum Silentium" (70), and depicts a woman under stress of high and silent emotion, expressed not only in the tenseness of the facial muscles but in the rigidity of the arms and wrists. Both these prints are of admirable quality, and of the kind that is not best appreciated from the opposite side of the room.

Another worker who comes to the front this year is Lionel Wood. He sends a most engaging portrait of a young girl with an expression that is spontaneous and instantaneous—two qualities that were ever sought for by the masters of old and only secured by the very best of them. Here is a matter in which photography has broken new ground, but has not given it much intensive culture. The work by Mr. Wood is "Miss Hawthorne Wood" (23), whose parted lips will win for her many admirers. Charles Borup seems to have asserted himself also. His best works are "Mrs. Thomas Foster" (238) and "Molly Mortimer" (279), a very charming little girl cuddling a cat. We understand that it is a portrait of Mr. F. J. Mortimer's daughter. The other work is perhaps more original, and though very flat in its modelling, it is a most attractive print, and possibly one of which the style would prove popular for the kind of subject dealt with. Perhaps we should also include among the few who have reached their high-water mark in this show the name of Yevonde, who has had the discernment to adopt a formal and deliberately simple treatment for the style of sitter shown in "Eleanor Alderson-Smith" (223). The lady has clear, sybil-like eyes that are deep, calm, and steady in their gaze; her hair is smooth and symmetrically dressed, the lines of her face pure and classic. Yevonde has fittingly placed her before us at full-face, and has not permitted any trace of "expression" to mar the static formality of the effect. We wish she had extended this wise choice to the restless background.

After two or three years of portraiture of the dramatic or

A sheet of drawings found within the last few days between Pall Mall East and the Princes Galleries, Piccadilly, has come into our possession. We cannot think with what object the artist has made what appear to be perverted versions of notable works of pictorial photography, but at the risk of infringing his copyright, and thinking that perhaps others may like to share the irresponsible fun which appears to have been his only motive, we have reproduced his sheet exactly as it is.

dynamic kind, it is agreeable to find that there is a tendency now towards the simple in pose and effect, and that where there is a subject of smooth, strong lines and pure form the influence upon the photographer has not been lost. Examples of this feeling for classic form are seen in C. Scarabello's "Irene" (184), a beautiful head and bust, on which the very folds of the garment recall the qualities of sculpture; in Louis Fleckenstein's "Cecilia" (168), a native of some sort, but a representation nevertheless on the classic lines of largeness of style and generalisation, with a perfect gradation of light over all; and in "A Girl's Head" (283), by N. Sviatscheff. The nobility of style that characterises this class of work relies, it will be seen, upon the realisation of roundness and the play of light under a simple scheme of illumination. The modelling will be full, the light and shade well contrasted, and the forms severe, without those other charms of elaboration, intricacy, ornaments, sparkle, variety of texture, and surrounding incident.

In the opposite direction we have works like Yvonne Park's "Queen Elizabeth—impersonated by Miss Laura Cowie" (84), which is simply a mass of elaborate forms and glitter; the two red prints by A. F. Kales, "Margaret de la Motte" (109) and "Portrait in Red Chalk" (115), neither of which are more than touchy kind of sketches, with no suggestion of roundness; Charles Taylor's "L'Apache" (128), an absolute complexity; even the charming "Ann Forest" (135), which is all but a silhouette; or the very effective "Sheila" (263), a front-face head in a circle by Monte Luke.

We have remarked that the workers from whom, in the past, we have had pictures that touched the top degree of current work have not in this collection surpassed their former efforts. Let it not be thought, however, that they have fallen appreciably below the standard expected of them. Herbert Lambert's "Stephen" (29), a handsome youth in a "sweater," is a fine piece of work of that kind that is an ornament in a gallery or an immense dining-room; it would be a little overpowering in a small room. Pirie Macdonald's "J. Leeming Walker" (57) we have already admired at Russell Square. Its great characteristics are the smile and the monocle. A. Keith Dannatt sends more of his psychological essays in unhappy humanity. "Portrait Study" (123) is a picture of anxiety and trouble, and, like his "Etaples Types" (53), is a presentment unredeemed by the pathos he gave us last year in these studies. The large print sent by C. Pollard Crowther, "Russell Thorndike as Peer Gynt" (174), misses nothing of that skill Mr. Crowther displays in getting the last ounce out of his model, but in this case the work has been flattened by the dark all-over tint in which the subject is submerged. W. Crooke's "H. S. Gamley, R.S.A." (240), is at that standard of efficiency beyond which it seems impossible for Mr. Crooke to advance. The same may be said for H. Vandyk's "Bourgamestre Max" (261).

"Joseph Pennell" (408), by R. T. Dooner, arrested our notice at Westminster recently, and we are glad that it has found a place here, for it is a splendid example of an harmonious scheme of tones, besides being an exquisite piece of portraiture. The Earl of Carnarvon, in "Portrait" (293), though not, perhaps, surpassing himself, gives us a clever and delightful picture of a lady with a gleaming headdress and her face in shadow, a work which will certainly confirm his reputation.

We may venture a word or two of criticism upon a print or two well worthy of examination. What a pity that P. Chaumoff allowed the hard, black contour of the back of "Rodin" (13) to come in at all! The figure would have been much better placed if the trimming knife had cut right through the sculptor's figure. Would it not have improved H. v. Wadenoyen's "J. Brandon Thomas" (54) if it had been smaller in scale for the paper, and thus truncated fewer of the forms? And could not L. Fleckenstein's admirable "Louise Vandahof" (45) have been a little less yellow?

A strong exhibitor of pre-war days has returned to the arena, and we are glad to welcome Furley Lewis, with his "John Galsworthy, Esq." (43), a work that is replete with the style and charm of old. Another reappearance is that of Reginald Craigie, who once held the tiller of this ship of rebels when it adventured on waters uncharted by the R.P.S. He exhibits "A Portrait" (277) of a gentleman, in profile.

We cannot in fairness to high merit leave this review without recommending to the visitor's notice the following few works: "Joan—daughter of Julius Harrison" (119), by Herbert Lambert, for the delightful torsion of the little maid's pose; "J. Craig Annan, Esq." (155), by N. E. Luboshez, for its marvellous rightness everywhere—the poetry of the ordinary (this applies to the sitter's clothes, not to his personality); and the same worker's "Portrait" (183), whose "bright smile haunts us still"; another smiler, a brigand, by Mrs. Ambrose Ralli, for its masterful management of white and black, called "At Corinth" (209); Rd. N. Speaight's "Study of a Child" (256), for its object-lesson in harmony of line, "The Rt. Hon. Viscount Grey" (267), by E. D. Young, for its convincing vitality and three-dimensional merits, and "The Poacher" (291), by G. H. High, for its admirable spacing.

To speak of more would simply be to extend this notice into a mere catalogue of things all remarkable for some quality or other.

F. C. TILNEY.

FORTHCOMING EXHIBITIONS.

September 9 to October 7.—London Salon of Photography. Particulars from the Hon. Secretary, London Salon of Photography, 5a, Pall Mall East, London, S.W.1.

September 11 to 15.—Professional Photographers' Association, Prince's Galleries, Piccadilly, London, W. (Trade and Professional). Hon. Secretary, Richard N. Speaight, 157, New Bond Street, London, W.1. Also foreign invitation loan exhibition of professional portraiture. Hon. Secretary, Marcus Adams, 43, Dover Street, London, W.1.

September 18 to October 28.—Royal Photographic Society Annual Exhibition. Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

October 18 to 21.—Rotherham Photographic Society. Latest date for entries October 4. Hon. Secretary, S. G. Liversidge, Orissa, Gerard Road, Rotherham.

October 18 to 28.—Portsmouth Camera Club. Latest dates: Entry forms, October 11; exhibits, October 16. Particulars from the Hon. Secretary, C. C. Davies, 25, Stubbington Avenue, North End, Portsmouth.

1923.

March 2 to 31.—Pittsburgh Salon of Photography. Latest date, February 5. Secretary, Charles K. Archer, 1,412, Carnegie Building, Pittsburgh, Pa., U.S.A.

March 13 to 16.—Exeter and West of England Photographic Exhibition. Particulars from the Hon. Secretary, Frederic G. Tutton, 9, Union Road, Pennsylvania, Exeter.

THE FREE SITTING.—The way in which members of the public regard the system of offering sittings (and portraits) for nothing, is shown by the following paragraph by the London correspondent of the "Glasgow Herald." He writes:— "I have just met an author on his way from Bond Street, where he had been graciously "giving a sitting" for "camera studies" to a well-known firm of photographers. The request that he should do so, he tells me, reaches him from one or other of the big photographers every year—and has done so for the past 20 years and more. Yet he is not a popular novelist, and his countenance has not appeared in the press above three or four times in all those years. He suggests that the photographers must work their way through some popular book of reference during the slack seasons, and that without any nice discrimination as to the popularity of those whom they invite to be taken."

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

THE NEW PRESIDENT.

By the election to the presidency of Mr. Alexander Corbett, the Professional Photographers' Association honours one who has been connected with it from the day of its establishment, and throughout the twenty-one years of its existence has been one of its heartiest supporters. Mr. Corbett began his career as a professional photographer thirty years ago with Mr. Alfred Ellis (Ellis and Walery) in Baker Street, and during his early days in that firm was one of the pioneers in studio portraiture by artificial light. Some years ago he established a studio of his own in Orchard Street on the site which is now occupied by the extension of Messrs. Selfridge's building. It was a very fortunate choice for a new business, since the entrance way (which was all the display which Mr. Corbett could obtain) was sandwiched between two large

Portrait by Richard N. Speaight.

MR. ALEXANDER CORBETT,
President Professional Photographers' Association, 1922-23.

drapers' shops, so that the constant procession of feminine shoppers automatically had the portraiture of Mr. Corbett brought in front of their noses. Portraits of many notable society people, among them H.R.H. The Princess Royal, brought Mr. Corbett into further notice as a photographer of talent, and thus on being compelled to find new premises for his business within a comparatively short time of its establishment he was able to transfer it with success to the present premises about midway along Baker Street, where his studios contain a very modern equipment of electric light by which a great deal of his work is done.

Mr. Corbett has been a member of the Council of the P.P.A. since 1911, and may perhaps be described as one of its most independent members, since in several matters he has emphatically dissented from the opinions of the majority. Unlike many photographers in the West-end of London, he has always set his face against the practice of the indiscriminate offer of free sittings. With scarcely an exception, all the portraiture in his business is commissioned by the customer; and it is worth while to refer to this fact, because it shows that this policy is not inconsistent with a considerable revenue, by arrangement with the sitters, in the shape of reproduction fees from the newspapers.

Mr. Corbett takes a strong interest in the local affairs of the district of London in which his business is carried on, and for the past three years has been a member of the Marylebone Borough Council. The new President of the P.P.A. is thus one of its oldest members who unites in himself a long and successful career, artistically and professionally. He has devoted himself to his art, and, in answer to our question, had to admit that his only recreation was—photography. Members of the P.P.A. may depend with confidence that his election is a wise choice of president to continue the forward movement in the P.P.A. which the last twelve months have marked.

"HARD" AND "SOFT" PLATES.

SOME little time ago a good deal was said and written about "grades" of development papers. For some years past the majority of photographers have taken a sort of "take it for granted" attitude that bromide paper was soft, and gaslight paper was hard or contrasty. That both makes included both grades was not generally admitted. As a matter of fact, most bromide paper was rather soft at one time, but some makes were more contrasty than others For some time now, however, it has been possible to get the same make in a number of grades, while the two or three grades of gaslight paper are, or should be, well known. A number of articles and some controversy on the subject were calculated to clear up any doubt on a most important point, but even now one hears experienced hands referring to negatives that are suitable to bromide and others that require gaslight, observations that are quite meaningless. And even manufacturers advertise papers in "grades" of "rough," "smooth," "glossy," etc., a practice which leaves us in doubt as to what a "grade" really is after all.

A particular make of bromide paper can be had in any surface in a series of grades ranging from soft to exceptionally hard. As the grade titles suggest, these papers will deal with a series of widely different negatives, ranging from the hardest to the flattest. While this may encourage slackness in negative making, it is nevertheless a boon to the man who has to deal with other people's negatives, and the use of a series of grades, or even two grades, explains the fundamentals of soft and contrasty emulsions better than any number of words can.

A definite choice of grades, always a feature of gaslight paper, more recently applicable to bromides, is now possible with plates. A soft grade of their Eclipse plate has been marketed by the Imperial Co.

The demand for soft plates is parallel to that for hard and soft papers, but the two cases are not exactly parallel in every way. One can get hard or soft results from any plate emulsion by careful handling; the same does not apply to papers. And the speed of a plate very often indicates the most likely character of a negative made by normal treatment. There may or may not be scientific reasons for this, but in practice it is generally so. Therefore it would seem the grades of plates are not so necessary. But there is scope for a plate which will readily give one a fairly definite contrast without undue deliberation in handling, and regardless of speed. This is evidenced by amateurs' films, which are—by reason of standard development—at the mercy of the manufacturer as to contrast. Negatives taken on X's British film are different altogether to others taken under identical conditions on Z's American or Y's German spools. This means that the amateur who does his own printing, and believes in one kind of paper, must stick to one make of film to avoid trouble. I remember a case that happened with a professional friend who was fond of soft bromide paper and would not try anything else. It was in the early days of the R.S. Lightning Plate. He took up this plate on account of its speed, but could never get bright prints from the negatives. I advised him to develop them longer—the negatives—but as he used a dish and was naturally careless about light, this resulted more in fog than anything else. So I advised getting a more brilliant paper, but that he would not do. Then I said that it would be as well to go back to the R.S. Rapids which he had been using before, and on which he always got contrasty negatives. He did so, with the desired results, but had to sacrifice speed This was no fault of the fast plate; it was merely that it *readily* gave soft negatives, and my friend was more adapted to use something that *readily* gave hard negatives. There were no grades then.

To be able to use a plate that is addicted to giving a certain result, and will not give the opposite with deliberate handling, and to do that without using a speed which may or may not be

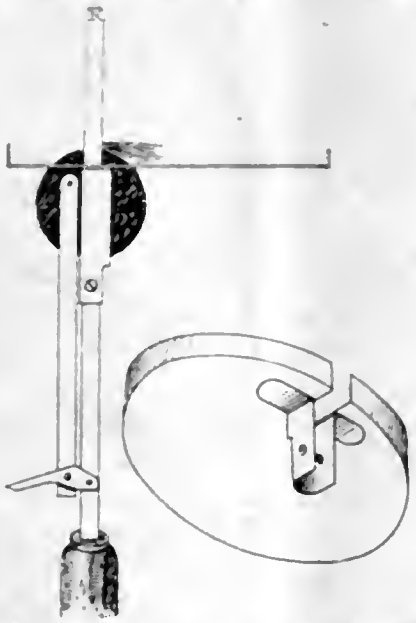
right is yet another power put into the photographer's hands. A fast plate which can be obtained in soft or ordinary grades is attractive. For example, indoor portraiture, especially when the wall paper is dark or the sunshine is getting in, is apt to produce harsh negatives no matter how careful we are. A decidedly soft plate is useful here. The same case arises with commercial work, for control of the light in machine shops and buildings is impossible as a rule, and it is as likely to be harsh or not. In fact, with any exposure, the scene may warrant a decidedly soft or hard emulsion, just as any negative may warrant a decidedly hard of soft paper; with this difference, of course, that plate emulsions have greater latitude than the others, and a plate can be developed to any one of a large number of "gammas" without spoiling it as a negative. The beauty of the choice of emulsions in this case lies in the predetermined character of the negative, which will be hard or soft according to the grade used—unless definite steps are taken to prevent it.—TIDERMIT.

Assistants' Notes.

Notes by and for assistants will be considered for this column. Payment for accepted contributions is made on the first of the month following publication.

A Flash-Lamp Igniter.

MUCH has been written, and many types of apparatus invented, with the idea of helping the professional as well as the amateur in flashlight photography. There is no doubt, however, that complete success depends largely upon the efficiency of the flash-lamp used and its ability to work each and every time it is called upon to do so. At the present time a large number of automatic gaslighters are appearing on the market, some of them being very efficient, with little or no mechanism to get out of order. One of these instruments, costing only sixpence, has been



adapted as a flashlamp igniter, and has proved an eminent success. To turn this lighter into an efficient flashlamp requires but little mechanical skill, but should it be found necessary, a tinsmith would make the required adjustments at a very small charge.

First obtain a cocoa-tin lid of about 3 or 4 inches diameter, and with a pair of scissors cut out a strip along the diameter nearly one inch long and a quarter of an inch wide. Now take a thin strip of tin or brass 2 inches by 1¼ inches, and bend it along its length, making a groove of U-section sufficiently wide to allow the lighter to rest in it comfortably. The groove is now cut down about 1¼ inches and opened out, making a double bracket, as shown in the illustration. This bracket is now soldered to the tin lid, the open end corresponding with the piece cut out. The whole arrangement is then fitted to the gaslighter, and adjusted so that the sparks from the lighter are level with the lid. A small hole is now drilled through both bracket and lighter, and through this a screw with a nut on the end is inserted. This will keep the flashpan firmly fixed in position. It can now be readily seen that the finished article is easily held above the head of the operator and the camera, and sparks continuously let off with very little trouble, an important asset in flashlight photography. As in all flashlamps, it is advisable to heap the flash powder near the source of ignition, this being the only precaution necessary to render the lamp successful in its working. The total cost of this instrument need not exceed 1s. 6d.—S. C. GORDON.

A Levelled Draining-Board.

IN fitting up a dark-room it is frequently considered essential to give considerable space to sinks. Unless a good deal of large-sized work is to be handled, and neither space or cost is of great moment, this can be easily overdone. A draining-board of ample area, provided it really drains into the sink and not on to the floor, is less costly than a large sink, and more comfortable to work upon. Developing, toning, and so on, can be done just as well upon the board by the simple expedient of screwing on it lengthwise strips of wood about an inch thick, and tapered to the same slope as the draining-board, but reversed so as to produce a level top, while spilt liquid runs away underneath. Such a board is quickly washed down and mopped dry when it serves as a bench for many purposes.—D. C.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications August 28 to September 2:—

FILMS. No. 23,360. Photographic films. Gevaert Photo-Producten N.V.

APPARATUS. No. 23,524. Apparatus for development, fixing, washing, etc., of photographic films, etc. C. H. Kruger.

PRINTING. No. 23,816. Photographic printing devices. B. Wehrli.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

HOODS FOR CAMERAS.—No. 183,626 (May 13, 1921). According to the present invention there is a collapsible hood having a flap hinged at or near to the outer end, such flap being fitted with a lens, so that when the hood is in position on the camera, the flap can be arranged to permit the image on the focussing screen to be viewed through the lens, and when the hood is removed from the camera, the flap can be turned about its hinge into or within the hood to allow the hood to be collapsed into a flattened form.

The hood may have a portion of substantially rectangular cross section for fitting on to or into the existing focussing hood of the camera and a tapered portion extending rearwardly therefrom, at or near to the end of which tapered portion, the flap, fitted with the lens, is hinged.

A hood, constructed in accordance with the invention, is shown in the accompanying drawings, in which fig. 1 is a perspective view of the hood in the open position; fig. 2 is a perspective view of the hood in the closed or folded position; fig. 3 is a longitudinal cross section of the hood in the open position; figs. 4 and 5 are end elevations of the hood, in the open and partly folded or closed positions respectively; and fig. 6 is a diagrammatic view of the hood applied to the existing hood of a camera.

In carrying out the invention according to one mode by way of example, as shown in the drawings, an open-ended hood 1 of rectangular cross section, tapering from a point 2 a suitable distance from one end 3, to the opposite end 4, is provided with collapsible or foldable side walls 5. The top 6 and bottom 7

of the hood may be constructed of pasteboard, cardboard, millboard, or any suitable material, and the side walls 5 may be made collapsible or foldable by constructing them of flexible material such as leather or linen, or they may be formed of comparatively rigid material such as pasteboard, cardboard, etc., and each divided along the horizontal centre line into two parts, and the parts hinged together.

It is advisable, when the side walls are constructed of flexible material, to form a permanent crease 8 along the horizontal

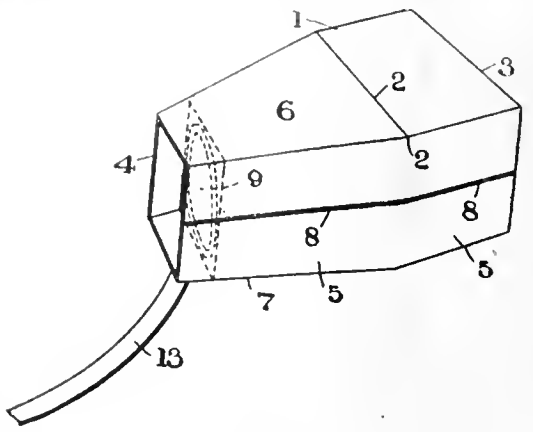


Fig. 1.

centre lines to ensure neat folding without crumpling or wrinkling of the walls. A rectangular flap 9 provided at the middle with a suitable lens 10, is transversely disposed within the tapered end 4 of the hood 1 and is hinged at its upper edge 11 to the top of the hood.

A convenient method of mounting the lens 10 in the flap is to arrange it in the opening between two circular frames 12 riveted

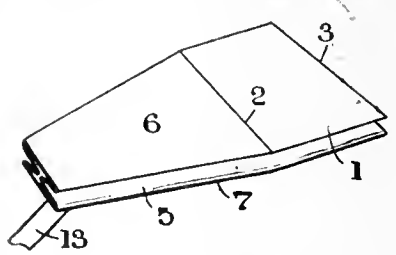


Fig. 2.

one on each side of the flap. The depth and width of the flap correspond with the internal depth and width of the hood at the point at which the flap 9 is fitted, so that when in the vertical position it closes the hood at the tapered end.

A tab, ribbon, or cord 13 is connected to the lower edge of the flap, and is passed through a slot or hole 14 formed in the bottom 7 of the hood. The flap is hinged to the top of the hood

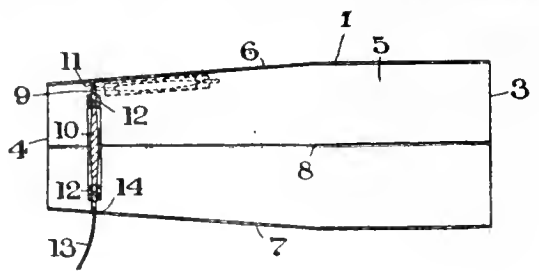


Fig. 3.

at a point a short distance in from the outer extremity of the tapered end 4, but, if desired, may be hinged at each extremity.

In use, the hood is opened out and the larger end 3 is fitted into, or, as shown in fig. 6, on to, the existing focussing hood 15 of the camera 16, the ribbon or string 13 being pulled to draw the flap 9 into a vertical position, so that it closes the tapered end of the hood, as illustrated in that figure. The larger end 3 of the hood should fit fairly tightly in or on the existing hood 15, to enable the one to be held in position in or on the other.

The operator can now view the image on the focussing screen,

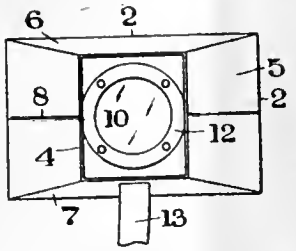


Fig. 4.

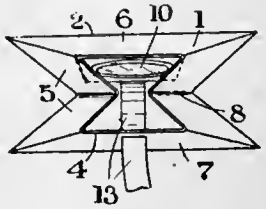


Fig. 5.

through the lens in the flap 9, thus enabling him to compose his picture and to carry out the focussing operations.

When not required for use, the hood is removed from the camera and the top and bottom are pressed together, whereupon the side walls collapse or fold inwardly towards one another along the horizontal centre lines, the hinged flap moving upwardly into

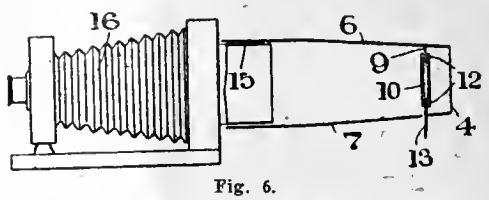


Fig. 6.

a horizontal position, indicated in dotted lines in fig. 3, so that the hood finally assumes a compact flattened form as shown in fig. 2, convenient for carrying in the pocket.—Thomas Peacock and Newman and Guardia, Ltd., 17 and 18, Rathbone Place, London, W.

The following complete specificatione are open to public inspection before acceptance :—

FILMS.—No. 185,097. Photographic films. Gevaert Photo-Producten Naamlooze Vennottschap.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

THE KEY TO SUCCESS (BULLDOG-WORLD DESIGN).—No. B425,574. Photographic papers. Kappa Works, Ltd., Mogden Lane, Isleworth, Middlesex, baryters and manufacturers of photographic papers. April 27, 1922.

GLASGOW AND WEST OF SCOTLAND SOCIETY OF PROFESSIONAL PHOTOGRAPHERS.—Although there is, as a rule, a lull during the summer months in the activities of photographic societies, this society is very active just now in carrying out the necessary arrangements for holding a photographic exhibition. The McLellan galleries have been engaged for the event for the week commencing October 2, 1922, and there has been a ready response by professional photographers in the City for space at the exhibition. The Lord Provost of Glasgow has consented formally to open it on Monday, October 2, and it is anticipated that there will be a large and interested gathering on the occasion. Tea will be supplied, and the comfort of friends present attended to in other directions. Mr. C. Pollard Crowther, F.R.P.S., of London, is also expected to be present at the opening, and has kindly consented to deliver addresses on certain evenings during the week. The exhibition arrangements are in the hands of a sub-committee consisting of Messrs. J. R. Brinkley (President), Archibald Fairbairn, Q. R. Whyte, J. G. Mainds, R. Shankland, and the Secretary of the Society, W. A. Callander, Solicitor, 100, West Regent Street, Glasgow.

New Materials.

IMPERIAL ROLL FILM.—That a film bearing the name of the Imperial Dry Plate Company should be of the highest quality is a proposition that scarcely calls for proof or confirmation. The numerous users of Imperial plates in all parts of the world will at once assume that an Imperial film is of the best, and they will not be disappointed. Nevertheless, we have taken the opportunity to expose a few of the spools, kindly sent to us by the Imperial Company, and under the ordinary conditions of exposure in a cheap film camera, obtained negatives which left nothing to be desired. The film is wound on an all-metal spool, and each spool is wrapped in a waterproof paper before insertion in the green cartons, which give a distinctive appearance to the product in the dealer's window. For development the Imperial pyro-soda formula is recommended, the films developing readily and obtaining good vigour and contrast in about three minutes. Spools are supplied in a range of 17 sizes, from 4 x 5 cm. up to postcard. From the long list of cameras, spools for which are supplied, there must be very few film cameras on the market which cannot now be fitted with Imperial film.

BORAX M.-Q. DEVELOPER.—This type of developer for obtaining warm black tones on bromide paper is growing in popularity, the prints obtained by its use being most pleasing in colour. Under the title of "Q tone" developer, Messrs. Wellington & Ward, Ltd., have placed upon the market a carton containing sufficient chemicals for compounding 80 ozs. of the developer ready for use. The chemicals are contained in two packets, a glass tube, and a paper bag. The contents of these are to be dissolved in 40 ozs. of warm water each; the solutions are then mixed together and the developer is ready for use. It can, however, be diluted with an equal volume of water before use if required. The developer is recommended for use with all grades of Wellington papers, including S.C.P. (Gaslight) B.B. and the special "Q tone" paper. We have recently had the opportunity of testing this developer, and find that fine warm black tones are obtained on most makes of bromide papers, the best results, however are obtained on Wellington "Q tone" paper. The carton containing sufficient chemicals, to make 80 ozs. of solution is retailed at 2s.

FRAMES FOR PORTRAITS.—We have recently had the pleasure of looking at many of the patterns of frames and mouldings therefor made by the Bernard Manufacturing Co., 115, Victoria Street, Westminster, London, S.W.1. The Bernard Co. has been fortunate in combining within its management long experience in the making of artistic wood mouldings and a knowledge of the styles and types of moulding which commend themselves to portrait photographers of reputation. The result is that the goods which they supply can be most emphatically recommended to the notice of photographic studios. They comprise a very great variety. Among them are gilt mouldings from the largest, suitable for large portraits in oils, to the narrow reeds appropriate to prints of quite moderate size. Their range of mouldings in fumed oak is equally large, but perhaps the most attractive and original of these uniformly tasteful goods are the mouldings of antique pattern and colour in gilt and the series of similar smaller mouldings in imitation art metal and wood. To select only one or two actual specimens from a large number, Nos. 5,285, 6,322, 4,663 and 3,896, will especially please those who wish to offer their customers distinctive frames of the beautiful colour and designs, such as were used in the eighteenth century. A more modern note is struck by No. 362 in gilt, silver or copper, whilst among the wood frames No. 5,274, of tortoiseshell pattern, is exceedingly pleasing. The Bernard Co. offer to send for 1s. (the cost of carriage) a set of about three dozen specimens of moulding, mounted on a stout board for hanging on the wall, and representing many times this number of mouldings differing from the specimens in size, colour, etc. Also the company makes a special feature of supplying frames in any size whatever. They have no stock sizes, but will supply frames of any size, complete with glass and backs, precisely at the listed prices of the mouldings. Thus the photographer has simply to measure up the length of moulding required in a frame of the size he wants, multiply by the number of frames, and can then quickly calculate the cost from the Bernard Co.'s list. Goods are sent by the company carriage paid. As regards the frames themselves, we should refer to their exceedingly good workmanship and finish. Special attention has been given to the fitting and polishing of the backs, which in some patterns are of wood and in others of card, and to the strength and neatness of the mitring. With these various points of quality and service to their credit, including dispatch of goods within a day of receipt of order, we are not surprised to hear that the Bernard Co. have rapidly obtained on their books the names of leading professional photographers throughout the United Kingdom.

New Apparatus.

The Focuslite Spotlight. Made by Cinema Traders, Ltd., 26, Church Street, Soho, London, W.1.

THIS lighting accessory for the portrait studio consists of a substantially made metal lamp body, containing a high-power lamp, mounted behind a condenser, and in the rear of which is fitted an optically ground mangin mirror reflector. This reflector so increases the power of the light that approximately 4 candle-power per watt is obtained. The lamp and reflector are adjusted by means of clamping screws, thus allowing a perfectly central light source to be obtained. The lamp body is supported in a U-shaped frame,

which enables the light to be swung up or down through a large angle and therefore directed to any part of the studio. The stand is also swivelling, thus allowing lateral adjustments to be made. By an ingenious device it is possible to project a beam of light of any size, from a few inches to 20 ft. in diameter, by simply sliding a knob fitted under the lantern which moves the lamp and reflector backward and forward. This is a great advantage, as a direct spot or flood of light can be used as desired.

The Focuslite is as useful in the daylight studio as it is in the one where artificial lighting is used, since it is a great aid to daylight for illuminating dark corners, portions of dress, etc. Rembrandt like effects can easily be obtained by placing this lamp in the correct position to illuminate the sitter.

A special matt screen is supplied to fit in front of the lantern for diffusing and a tinted screen, also supplied, tones down the beam to approximate daylight. Amongst the special uses of this lamp in studio work is the production of firelight studies, for which the lantern is placed near the floor, while for spot illumination and backlighting it is invaluable. The lamp can also be used for illuminating articles for copying, as with the diffusing screen in position, a perfectly even lighting is obtained.

The lamp is mounted upon a strong, well made stand, running on casters, and is thus available for instant removal to any part of the studio. The apparatus is easily packed for transport if necessary, and for use is connected by a plug to the ordinary house lighting circuit. No resistance or alterations in the wiring or fittings are necessary.

The Focuslite Spotlight is supplied in two sizes, viz., 1,000 candle-power and 1,500 candle power, the price of the first being £8 15s. and of the second £9 5s. These prices include everything necessary for immediate use. We have had an opportunity of seeing this lamp in operation, and have no hesitation in recommending it for general studio use to our readers.

£3,000 COMPETITION.—The organisers of the competition in which £3,000 is being awarded for photographs made on dry-plates have issued a *de luxe* booklet of excellent reproductions in photogravure of photographs which received awards in the first part of the competition. The booklet shows the interest and artistic quality which characterised the work to which prizes have been awarded. In connection with the second part of the competition, closing at the end of the present year, a booklet has also been published describing the simple equipment which is sufficient for taking part in the competition and giving some hints on the profit which may come to those who take up photography under this stimulus. Both booklets may be obtained on application to the headquarters of the competition, 4, Oxford Street, London, W.1.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, SEPTEMBER 18.

Southampton C.C. Demonstration and Exhibition of Colour Photography.

TUESDAY, SEPTEMBER 19.

Bournemouth C.C. "Some Experiments with Desensitol and Colour Sensitiveness of Plates." W. Dieselhurst.
Hackney Phot. Soc. Canterbury Cathedral. S. D. Miller.
Manchester Amateur P.S. Exhibition of the "Amateur Photographer and Photography" Prize Prints.

WEDNESDAY, SEPTEMBER 20.

Bradford P.S. Outing. Visit to Birkshall Gas Works (Laisterdyke).
Dennistoun Amateur P.A. Final Stages of Winter Syllabus.
Exeter Camera Club. Outing to Bystock.
Rochdale Amateur P.S. Exhibition in Studio of Members' Prints from Rambles.

THURSDAY, SEPTEMBER 21.

The Royal Photographic Society (Pictorial Group). "Sunlight and Other Matters." Hugo van Wadenoyen, F.R.P.S.
Hackney Phot. Soc. Ickenham to Denham.

SATURDAY, SEPTEMBER 23.

Hackney Phot. Soc. City Outing. H. E. Wood.
Rochdale Amateur Phot. Soc. Outing to Ealees and Hollingworth.
South Glasgow C.C. Outing to Callander.
Willesden Phot. Soc. Outing to Bankside.

CROYDON CAMERA CLUB.

Mr. J. W. Walker read a short paper on the "Marion Record Iso Plate," to which he has recently been giving a thorough test for varied out-of-door work.

Braced by an unrivalled reputation for disaster, the lecturer should have courted and experienced nothing but failure. Nevertheless, excepting early errors due to over-exposure, success was attained, judging by the many excellent prints shown from negatives made on this ultra-fast brand, primarily designed for portraiture in the studio.

The rapidity of the Record plate, he said, is almost beyond belief, and in case of doubt it is always safer to halve the estimated exposure than to double it, as is the practice with some workers with plates of moderate speed.

Very little latitude existed in the direction of over-exposure, whilst the contrary prevailed with under-exposure. In fact, it seemed difficult to under-expose Record plates, and extremely easy to ruin the negative with even moderate over-exposure.

On an average out-of-door subject in diffused summer light, 1-140th sec. at f/6.8 with a K1 filter in use gave ample light-action, the filter increasing exposure about twice. For a narrow street scene, 1-100th sec. at f/8, without filter, would be found about right. These speeds were actual, not reputed.

Among his friends, all who had used the plate for portraiture and interior work had praised it highly; others who had employed it for landscape work were not invariably enthusiastic, a general complaint being the inability to secure sufficient density. He had also experienced this occasionally, Naturally, with a plate of such extreme speed it was not all jam, and from start to finish great care in all manipulations had to be exercised. The Record plate undoubtedly put a new power in the hands of the photographer, and rendered a tripod superfluous in outdoor work.

In the discussion Mr. Harpur said the Record plate was the fastest plate he had dropped upon "so far as related to exposure," and he was now using it for landscape work. Mr. Salt hoped any beginners present would not follow Mr. Harpur's example. Plates of such extreme speed were invaluable for special purposes, but in the majority of cases photographers needlessly handicapped themselves by using them.

Mr. Hibbert pointed out that lack of density was often due to insufficient development, which with these plates frequently had to be prolonged. He recommended a little bromide in the developer. In answer to questions, Mr. Walker said granularity in the negative appeared pronounced, but was not observable in contact prints and hardly apparent in enlargements. In cases of known over-exposure it was often possible to save the negative by adding to every ounce of developer 30 or 40 drops of bromide. "Any particular strength?" gently inquired a member. "Ten per cent.," answered Mr Walker, adding a pleasing reference to intelligences expressed as a minus quantity.

News and Notes.

EXETER CAMERA CLUB.—The Exeter and West of England photographic exhibition will be held from March 13 to 16, 1923, under the auspices of this club, the secretary of which is Mr. Frederic G. Tutton, 9, Union Road, Pennsylvania, Exeter.

LAMBERT WESTON & SONS, LTD.—By an error on the part of the advertising agents, the address of Messrs. Lambert Weston & Sons, Ltd., appearing in the advertisement of Messrs. Ilford, Ltd., in our issue of last week, page ix., was given as 30, instead of 39, Brompton Square, S.W.

MR. S. GRIMSHAW, the well-known exponent of the Bromoil process, had joined the staff of Messrs. Kosmos Photographics, Ltd., Letchworth, Herts. He will be available for lectures and demonstrations upon the process during the coming season to photographic societies.

THE PROFESSIONAL PHOTOGRAPHER.—The September issue of the Kodak Company's magazine contains an illustrated interview with Mr. Arthur J. Winter, of Preston, accompanied by reproductions of his work in portraiture. There are also examples of the portrait work of Mr. Eugene R. Hutchinson, of Chicago.

HOUGHTONS' PROFESSIONAL BULLETIN.—The September issue describes new mounts and mottoes suitable for photographs as Christmas presents, and announces a new book "Studio Advertising," which has been written by Messrs. Houghtons' publicity manager, and is shortly to be published, price 2s. 6d.

PRESS PHOTOGRAPHERS' SALARIES.—"The Journalist," the organ of the National Union of Journalists, states that "after negotiations lasting several months the Union has made a new agreement as to salaries and conditions with the Proprietors' Association of Press Photographic Agencies." The text will be published in two or three weeks' time.

SUMMER TIME.—In consequence of the numerous inquiries which have been addressed to him, the Home Secretary desires to give notice that, in accordance with the Order in Council of March 15, 1922, Summer Time will not cease until 3.0 a.m. (Summer Time) in the morning of Sunday, October 8, when clocks will be put back to 2 a.m. The shorter period of Summer Time prescribed by the Summer Time Act, 1922, does not operate this year.

THE P.P.A. RECORD.—The third issue of the official monthly journal of the Professional Photographers' Association, shows that our contemporary is getting into its stride in regard to typographical setting as well as in respect to the arrangement of its contents, which in this issue are chiefly devoted to the current Congress. Mr. Hana gives the first draft of a scale of prices for commercial photography, and we note also the starting of a key to current photographic literature, consisting of brief indications of articles of interest to the professional photographer, published in the British and foreign photographic press.

INSTRUCTION IN PROCESS.—The prospectus of the day and evening classes in photo-engraving, held at the L.C.C. School, Bolt Court, Fleet Street, has just been published for the session, which opens on September 25. The school, as many of our readers know, provides a full course of training in the practical methods of half-tone block making, zinco and three-colour, flat-bed and rotary photogravure, and photo-lithography. The school is admirably equipped with all the apparatus for practice of these processes upon the commercial scale, instruction comprises, in each branch, lectures and practical work, and, in addition, there is a course of lectures on the principles of photo-mechanical methods by the principal of the school, Mr. A. J. Bull, to whom application should be made for the prospectus and for advice in taking up instruction in any given branch of work.

PHOTO-MAPPING MANHATTAN ISLAND.—Several of the American illustrated papers have published reproductions of a remarkable photographic mosaic map of Manhattan Island. "Popular Mechanics" gives a reproduction of the picture, also an account of how it was taken, and from the account we clip the following details:—"A hundred exposures taken at an altitude of nearly two miles resulted in a map, 8½ ft. long and 28 in. wide, showing more than 32 square miles of New York City, with every object, even to the pedestrians, plainly portrayed. The machine that made this possible is a large camera, weighing 36 lb., which uses a film similar to that of any ordinary camera, though very much larger, and having an electric timing device that regulates the exposures in proper relation to the speed of the aeroplane, from

which the camera is operated. The shutter exposes the film in 1-150th second—such a short period that the exposure is entirely unaffected by the movement of the aeroplane. The new camera is equipped with an automatic device for regulating the intervals between exposures in accordance with the speed of the aeroplane and by means of another innovation the roll film is held without vibration."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE BEGINNER IN PHOTOGRAPHIC SOCIETIES.

To the Editors.

Gentlemen,—Most of the photographic societies are now waking into activity again, and the point is arising what to do with the beginners who will undoubtedly wish to join. If beginners are accepted for membership they should naturally be given instruction in the elements of photography, and helped in every way. This is a difficult proposition, and almost every secretary will say, "How troublesome it is to get members who are good workers, to instruct these beginners." My own point is that the beginner should not be allowed to join a photographic society until he has a good knowledge of exposure and development, and can produce a good printing negative. All photographic societies exist with the purpose of furthering the popularity and usefulness of photography, and if they are to be burdened with a batch of beginners each year then progress will be stopped.

I should propose that the absolute beginner get his early instruction from one of the numerous schools which exist in the London area, and then when he can produce a certificate from the instructor of such school that he has had at least one season's instruction he may be allowed to join the society. This would ensure all members of the society having a certain degree of photographic intelligence, and lecturers would not then have to answer the silly questions which are often asked them.

Yours faithfully,

A. V. W.

SYSTEM IN HALF-TONE OPERATING.

To the Editors.

Gentlemen,—I hoped that I had finished with the very long correspondence on the above subject, at least for the time being, but Mr. Sukumar Ray's letter needs a reply, so I must carry on.

As regards the much-discussed article by the late Mr. U. Ray, I think that it is an example of how the full intentions of an author sometimes fail to get home to the reader. As my disagreement with the penumbral theory as exemplified by his geometrical projection opens up a wide field for argument, I hope I may be permitted to defer this to a later period, when I may follow up the present discussion by again presenting some of my own conclusions on the subject of the theory of half-tone dot formation.

As to Mr. S. Ray's experience contradicting my own, there is nothing surprising in that. There are so many possible inconstants, and working conditions are so variable, that approximately the same results can be obtained in a variety of ways, which is quite sufficient to ensure that I should find many to disagree with me. In fact, I did not expect any agreement, because I know that much of my system is contrary to accepted practice. That does not alter the fact, however, that the results that I have described are being obtained daily by the methods I have advocated. When I discover any system that is simpler or more certain I shall not hesitate to change over.

The type of negative that I aim at is one that will print upon metal with a standard exposure and correctly represent the subject, or such variation as may be necessary, and give the etcher the minimum of trouble, and, above all, satisfy the customer. This is the only type of negative that interests me.

I am very pleased to note the results of Messrs. Turner and Hallam's experiments in "flashing" as described at the "Royal" recently. They are entirely in accordance with my own experience that the very small flash stops, as advocated in some quarters, are entirely unnecessary. I wonder if they could be induced to give a clear exposition of what they understand as the penumbral theory of dot formation?—Yours faithfully,

E. A. Bierman, F.R.P.S.

Birmingham, September 11, 1922.

SILVERING MIRRORS.

To the Editors.

Gentlemen,—We have just read in No. 3,251, issued August 25, of the "British Journal of Photography," page 509, that mirror silvering by the formic-aldehyde process has been studied in 1912 by Mr. Everett King.

This process was studied by Messrs. Lumière Bros., in 1894, and described in the "Journal de Physique Théorique et Appliquée," page 29.

Later on, in 1904, Messrs. Lumière made a slight change in their process, and the new formulæ have been regularly published in the "Agenda Lumière," ever since 1904. We may add that at the Lyons astronomic observatory, the mirrors for the elbow equatorial and the siderostat are being regularly silvered by the Lumière process.—We remain, Yours faithfully,

Lumière & Jougla.

Lyons, September 8.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 6-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

C. H. W.—You can manage half-length and bust portraits in the room you describe, but it is too short for full-lengths, the focal length needed for these being only equal to the longest side of the plate (see table on page 566 of the current "B.J. Almanac"). You will require, at least, 2,000 c.p. for professional work, the exposure with 400 c.p. being much too long. We should recommend you to have one large lamp fixed upon a movable standard so that you could get some variety in the lighting.

J. L.—The only substance which will serve to ignite coal gas is spongy platinum black, a special finely-divided form of platinum metal. Owing to the high price of platinum this material is very expensive, but apart from that we do not think it would be of practical use for your purpose, since the gas will take quite a material time to ignite, and, moreover, the platinum black gradually loses its power of ignition. We advise you to abandon this device, and use some form of by-pass for the gas actuated by the pressure back of the printer.

H. B.—(1) The body of the enlarger can be used as an enclosure for the source of light. (2) The condenser should be removed, or, better, replaced by a sheet of ground glass. (3) Certain patterns of strip printer can be adapted for use on the back of the printing box. (4) You should use some of the hard grades (see advertisements) of bromide paper, which have recently been introduced. (5) Either developer may be used, but considering your requirements we think M.Q. would be preferable. (6) It is usual to obtain permission, since a photographer has no legal right to exhibit a portrait in his showcase which has been made to a customer's order.

L. H.—It is evident that the copyright in the views is your property, and you appear to have assigned to Mr. A. the sole rights to sell prints, presumably in postcard form. Your transaction with Mr. B. does not appear to be very well defined, but if, as stated, it was understood that Mr. B. was granted the right only of reproducing the two subjects in a book, then clearly the issue by Mr. B. of the two subjects as postcards is an infringement of your copyright. This is how the matter stands as regards copyright law. As regards breach of contract, the matter is rather more complicated, and we think that Mr. A. is quite justified in his annoyance, and is entitled to remedies against yourselves for permitting the reproduction of the two subjects as postcards by Mr. B. It seems to us that the crux of the dispute is the precise arrangement which you made with Mr. B., but it seems doubtful whether this can be definitely established on either side if it came to any legal action.

G. K.—For enlarging on bromide paper we should think a single good, inverted, incandescent burner, such as the "Howellite," of Messrs. J. J. Griffin & Sons, Kemble Street, Kingsway, London, W.C.2, would be sufficiently powerful for fairly quick-printing negatives, but as yours appear to be of more than average density it would, perhaps, be necessary to have four. The objection to so many is the considerable heat, but in a vertical enlarger you should be able to arrange a good-sized light box and also ventilation above it so that the enlarging room does not become unduly heated. With four burners, two thicknesses of ground glass placed about one inch above the negative should give sufficient diffusion of light. One thickness of ground glass and one of opal would be better, but the opal cuts out a great deal more light, and if you can do without it, so much the better for the exposure with your dense negatives. For enlarging on gaslight papers, we do not think the light of even four burners would be nearly powerful enough.

S. A. J.—To strip a wet collodion negative proceed as follows:—When the negative is thoroughly dry and cool, flow over with thin solution of rubber in benzole, 2 parts pure rubber to 100 parts benzole, or ordinary cycle tyre repairing solution thinned down to about the consistency of collodion will do. When this is dry, the negative is flowed over with "leather" collodion. This is prepared by adding a small quantity of castor oil to plain collodion. A good formula is:—Celloidin, ½ oz.; ether, 5 ozs.; alcohol, 5 ozs.; castor oil, ½ oz. When the collodion on the negative is dry (and the drying can be hastened by heat) the negative is cut round the edges with a knife and placed in a dish of cold water. The film should soon begin to loosen at the edges; if it does not a little acetic acid (up to 10 per cent.) may be added to the water. The film is now transferred to a piece of paper, and thence to the new support. If the negative is to be reversed it is transferred to another piece of paper before being placed on its final support.

Q. T.—You have been using the wrong developer for warm tones on the Q-Tone paper. There are separate developers for cold and warm tones, and although the amounts of water, metol and hydroquinone are the same the other chemicals differ, as you will see in the formulæ which we give side by side:—

	Cold Tones.	Warm Tones.
Metol	80 grs.	80 grs.
Hydroquinone	80 ,,	80 ,,
Soda sulphite (crys.) ...	2,400 ,,	800 ,,
Soda carbonate (crys.) ...	2,400 ,,	—
Borax (powdered)	—	800 ,,
Potass. bromide	20 ,,	2 ,,
Water	80 ozs.	80 ozs.

Development should be conducted for a standard time at a standard temperature, so as to ensure uniform results. Two minutes at 65 deg. Fahr. will be found the most suitable. It is worthy of note that with this paper brief exposure and long development decreases contrast, while longer exposure with brief development gives vigour. After development a rinse of a few seconds is all that is necessary, and the prints should then be fixed in hypo 4 ozs., water 20 ozs. for ten minutes.

R. B. W.—(1) It is impossible to say without trying whether the formula can be made up with very much less water than the 20 ozs. From the look of it we should think it would be possible to use, say, 10 ozs. of water, but when a developer of approximately this formula is made so concentrated, some of the chemicals are liable to separate out in cold weather, and if that happens they do not redissolve again completely when the solution is warmed, so that the balance of the developer is upset. (2) We think it is only ordinary experience that a developer made up with caustic soda does not work quite as well with many gaslight papers as one made up with soda carbonate, owing to the greater energising power of the caustic alkali. Usually we should prefer a carbonated developer for gaslight papers. (3) You could add soda carbonate to the caustic, or replace part of the caustic alkali by soda carbonate. It is entirely a matter of experiment by trial with different quantities of the two alkalies. (4) Potass metabisulphite will improve the keeping qualities of almost any developer, but it renders the solution slightly less alkaline and makes it, therefore, less energetic, *i.e.*, slower in action. (5) The only two books which can be recommended—and both are now rather out of date—are the "Chemistry of Photography," by Meldola, Macmillian, 6s., and "Photo-Miniature," No. 149, possibly obtainable from Houghtons, or from the publishers, Tennant & Ward, 103, Park Avenue, New York.

T. T.—I think there is no reasonable doubt that, in the circumstances which you describe, you have acquired a legal title to the copyright in the photographs, since it is evidently impossible to show that you were ordered by anybody to do the work, or expected payment from anybody. In these circumstances the reproductions of the photographs are infringements of the copyrights, and both of the newspapers have not any good defence in the plea that they thought the copyright belonged to the —— family and that, therefore, they could use them without making payment to anybody. It was their business to satisfy themselves on that point before they reproduced them. One newspaper has written quite a reasonable letter, and while it is absurd for them to say that the fee of 10s. 6d. is charged only for photographs of royalty, there is some ground for their contention that small provincial papers, such as theirs, do not regularly pay the fee of 10s. 6d. per photograph. We believe that 5s. per photograph is a very usual fee for such papers. But, on the other hand, they are both of them now in the position of having reproduced without the permission of the author, and while we do not recommend that undue advantage should be taken of this fact, it might very well be pointed out to them that under the Copyright Act you have good ground for taking action in the County Court for recovery of your fees. As no doubt you know, the only defence which can be put up is that the infringers did not know and had no reasonable ground for suspecting that there was any copyright in the photographs. Obviously in the case of such recent portraits no one connected with publishing could suppose that copyright had become non-existent. We think if you point out these facts to the two newspapers you will have no difficulty in coming to terms with them.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3255. Vol. LXIX. FRIDAY, SEPTEMBER 22, 1922. Price Fourpence.

Contents.

SUMMARY.

The proceedings of the Congress of the Professional Photographers' Association are further reported in this issue. The co-operative advertising of photographic portraits was the subject of two papers, one by Captain F. H. Wright, of the London Press Exchange, and the other by Mr. Hopton Hadley. The great success which has attended the advertising of other products by this method was instanced, and Captain Wright outlined a working scheme on the basis of the number of profeasional photographers in the United Kingdom. (P. 572.)

Mr. Pirie Macdonald, of New York, delivered one of his stirring addresses. It was a vigorous appeal for photographers to rank themselves with their sitters in intellectual interests and also to work for the realisation of their own ideals in portraiture. (P. 574.)

Mr. Herbert Lambert delivered an excellent address on the harm which was being done to photographers as a whole by want of confidence among themselves, particularly in the provincial towns. (P. 579.)

Mr. Frank Brown dwelt upon some of the unscrupulous methods employed in obtaining business. (P. 580.)

At the meeting to which assistants were invited, Mr. George Hana strongly expressed his hope that means would be found of bringing them in some form within the Association. (P. 578.)

Visits were paid to the National Gallery, National Portrait Gallery, and to the process works of the Amalgamated Press. (P. 581.)

A reproduction of the group of Congress members, photographed by Mr. W. B. Chaplin (Russell and Sons) on the East Terrace of Windsor Castle, will be found on page 576. A key to the portraits in this group will be published next week.

The sixty-seventh annual exhibition of the Royal Photographic Society is now open at 35, Russell Square. Mr. Solomon J. Solomon, in performing the opening ceremony, spoke most appreciatively of the pictorial effort in photography, and particularly commended certain exhibits. (P. 567.)

Mr. F. C. Tilney contributes a review of the portraits in the R.P.S. show, in which this class of subject is more largely accompanied by landscape than at the Salon. (P. 568.)

Landscape and genre subjects at the London Salon are reviewed in a further paper by Mr. Tilney. (P. 570.)

In a leading article we refer to the sources of profit which still remain very partially utilised in connection with the amateur's snapshots. Apart from developing and printing, which may be very profitable, or the reverse, according to circumstances, there is an untapped field in the supply of the best possible reproductions of small snapshots. (P. 566.)

At the Croydon Camera Club last week, Dr. D'Arcy Power lectured on the making of pastel drawings upon a two-colour photographic print obtained by toning. (P. 583.)

Some practical points on the use and fitting of an antinous release to a hand-camera are the subject of a paragraph on page 566.

The circular or oval shape may at times be chosen for a portrait, as was often done by the great painters. (P. 565.)

EX CATHEDRA.

The P.P.A. Congress. Last week's Congress of the Professional Photographers' Association has passed, leaving a host of pleasurable memories in the minds of the 291 members who attended it and a mass of reports of its proceedings, the whole of which, at the time of writing, we are afraid cannot be included in the present enlarged issue of the "B.J." Perhaps the subject which aroused most attention was that of co-operative advertising, which formed the subject of the addresses by Captain F. H. Wright and Mr. Hopton Hadley. It is a large project, one which has already been discussed in our pages during the early part of the present year, and also one which the P.P.A., if and when it comes to deal with it, must necessarily approach in a broad spirit. We will postpone further reference to it to a later issue, when our professional readers will have had the opportunity of studying the two papers which appear on another page this week. The assistants' evening was also a function embodying a less definite scheme, yet one which we hope will contribute towards linking assistants in photographic studios more closely with photographers as a body than has hitherto been the case. To these references to what has been a notable week, we must add a word, by way of warm appreciation, on the debt which the Association owes to its secretary, Mr. Alfred Ellis, upon whose shoulders a large part of the work of organisation has fallen. Without hurry or flurry, and with the genial diplomacy which is his, Mr. Ellis has carried the responsibility for an enterprise which was somewhat ambitious and which encountered numerous difficulties. He handsomely deserves the thanks of the Association.

* * *

Print Trimming. In these days of artistic, or perhaps in many cases "arty," photography, those who practise it seem very much afraid of departing from the rectangular form for their pictures. This is rather a pity, for very often the composition or balance of a portrait can be greatly improved by trimming it to an oval or even to a circular shape. It is not a bad plan to have on hand a few zinc ovals and circles in the sizes mostly used, and to try the effect of these upon prints which do not seem to be quite what is wanted. Photographers need not fear to use these forms, for many of the greatest painters have been glad to avail themselves of them. The circular Madonna of Raphael is an outstanding example. An actual square or a rectangle of nearly equal sides is also taboo with many workers, but in some cases it is just the right shape for the subject. Fortunately, we are free from the fetters of stock-sized mounts which called for standard sizes and shapes in prints. Now, an oval or a circle or a square may be mounted without the once indispensable line or plate mark.

The Antinous Release. With the approach of autumn, and the decline in the strength of the light, users of small cameras would do well to make sure that the apparatus they use is fitted with convenient and satisfactory means of giving time exposures when it is used on a stand. Cameras of quarter-plate size and over are invariably provided with some kind of flexible release, either ball and tube or antinous wire; but one meets very many of the smaller type where the only means of operating the shutter is a small trigger. Now, this is all very well for snapshot work, but when time exposures are attempted, the danger of introducing blur into the negative by movement of the front, or of the whole camera, is very great. Lack of stability between camera back and front makes these trigger-operated time exposures next to impossible with several types of small instruments, and one wonders why the antinous release does not become a universally adopted fitting for them. Most shutters are provided with a hole into which one can be screwed. In buying an antinous release, care should be taken not to get too short a one, as this kind produces almost as much camera movement as operating the shutter by trigger. They are made small, so as to fold up with the camera, but if a subject is worth the trouble of erecting a tripod, or selecting a suitable firm base, the slight extra work of taking a release from the camera case, and screwing it into position, will not be felt. Another point worthy of mention is that, in use, the antinous release should be kept as straight as possible. It can be held so bent that, in firing the shutter, it imparts considerable shake to the camera.

MONEY FROM SNAPSHOTS.

It is impossible to estimate, with anything like accuracy, the percentage of the population who use cameras of some sort or other. At most of our holiday resorts about half the visitors seem to be victims of the snapshot habit, and if this proportion is not maintained all over the country, it is a certainty that there are few families outside the poorest districts which do not contain one or more amateur photographers.

In past years the professional photographer looked upon the amateur as his natural enemy, or perhaps rather as a noxious weed which ought to be eradicated, and drove him into the arms of the chemist or other dealer from whom he had purchased his materials. This was in many cases due to the fact that the amateur had to do his own developing and printing, and discovered that a little profit could often be made by selling his productions usually at a ridiculously low price. This epoch has, however, passed away, and only a very small percentage of amateurs do their own finishing, and fewer still make any money out of their hobby. Therefore it will be seen that our title does not apply to any revenue accruing to the makers of the negatives, but to that which may be directed into their own coffers by intelligent professionals.

Every photographer must judge for himself whether it is to his advantage to take up ordinary film development and printing. If enough of this can be secured to put in a proper "amateur finishing" plant of tanks, printing boxes and film and print-drying machines, and also to engage special assistants, the work is worth doing, if the prices be not unduly cut, but the portrait photographer with a small staff and no special appliances will be well advised to leave it alone. It is in quite another direction that he must look, that is to say, in the production of the finest possible results from amateurs' negatives, and that at highly remunerative rates.

When we consider the amount that is spent upon such hobbies as golf, fishing, motoring and even gardening, it is perfectly clear that the money is there to be spent upon photography, if it can be shown that the results will justify the outlay. One who has had a long experience in this direction has testified to the business which has been done in oil paintings—business, running into three figures from amateur originals—of albums filled with enlargements, sets of lantern slides, often coloured, and many other branches of work.

The orders which reached photographers during and after the war should have shown them the value of the snapshot as a starting print. In how many cases was the only portrait of a son, brother or husband a little crumpled bromide print often scratched and worn? It would be carried about, before the knowledge that it could be reproduced in a permanent and glorified form occurred to the owners.

Some few words of advice or suggestion may be useful to those who have never given this matter their attention. The work must be approached with the intention of doing the very best that can be done in the circumstances, or it will be useless to expect to obtain a good price for it. First-class technical skill is necessary and the services of a really good finisher are essential, the first to carry out the work in the most suitable medium, and the second to give it the appearance of a good original photograph.

An example of a job actually executed is worth more than any amount of generalities which are apt to lack convincing power, so the following details are given. A rather poor V.P.K. print of a deceased officer is brought in and the photographer is asked if he can copy it. He agrees to do so, and inquires as to the size required. To this the reply is, "As large as possible," the price being left unsettled, as the customer appears prosperous. A copy negative is made rather larger than the original, and enlarged without retouching to 12 inches in height, a diffusing screen being placed in front of the lens. After mounting, the print is rubbed over with an oil medium and given a thin coating of warm black oil pigment, mixed with the same medium, all over the surface. This is roughly applied with a hog-hair brush and distributed with a pad of cotton wool. Without allowing this to become too dry the high-lights are wiped out with a soft rag, and the shadows, where necessary, strengthened with more pigment applied in the same way. Fine details are now put in with a sable brush, and finally, as the background is rather ugly, it is darkened with the pigment until a harmonious appearance results. It now resembles a good mezzotint, or, as one amateur said, a "fine Bromoil." At any rate, it was not considered dear at the five guineas which was charged, and, moreover, a dozen cabinet copies in platinum formed an agreeable supplement from the photographer's point of view.

If the photographer be a good business man, but lacks facilities for doing such work, he should secure the order and place it with a *first-rate* trade house, and pass on his instructions to make the best possible job. Even this will leave him with a profit of 100 or even 200 per cent. upon his outlay. It goes without saying that one or two specimens showing the original and the copy are very helpful in getting orders for this work. The old professional print and copy do not carry conviction like the snapshot.

ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

The house at 35, Russell Square was opened on Monday last for the sixty-seventh annual exhibition of the Royal Photographic Society. During the vacation the premises have been thoroughly renovated, and some changes made which, we think (although it does not appear to be the general opinion) are decided improvements. Volumes of periodical publications, which previously had been almost inaccessible in the room on the ground floor to the rear of the library, have been transferred to the library and accommodated in a large lot of shelving placed between the two windows and dividing this part of the room into two bays. Although the room is thereby somewhat darkened, it acquires a real library atmosphere, and the convenience of having every book in the Society's possession close at hand is one which is surely an advantage to the members. Moreover, the transference has enabled the rear room to be completely cleared, and this year it accommodates the Nature photography section of the exhibition, which is there well hung and quite well lighted.

The pictorial section is undoubtedly the best which has been brought together since the Society has held its exhibitions in its own house. This is perhaps due to the rigorous selection. Only 154 prints are shown. We think the Society is right in making the inclusion of an exhibit a real distinction as the result of a close weeding out of the inferior. The technical sections this year are also of greater interest. The Autochromes are lighted by direct electric light instead of by the mirror system previously employed, and there is a large display of lantern slides, perhaps rather too large a one, for the exhibit would have been somewhat more effective had the transparencies been separated by intervening dark spaces.

A full programme of lectures will be delivered during the period of the exhibition, each Tuesday and Friday evening at 8 p.m. To-night, Friday, September 22, the fixture is an exhibition of Affiliation competition lantern slides. Mr. Dudley Johnston will personally deliver the criticisms which he had prepared in course of making the awards. On Tuesday next Mr. Johnston will deliver a lantern lecture, entitled, "From Alp to Apennine." Among other lectures are those on Lourdes by Mr. T. H. B. Scott, on Carcassone by Dr. Atkin Swan, and on Aerial Photography by Major F. C. V. Laws. The exhibition remains open daily from 11 a.m. to 9 p.m. (Sundays excepted) until Saturday, October 28. Admission is free.

The technical section this year is both larger and of greater interest than in the case of the previous three or four exhibitions. Owing to the great pressure upon our space this week, caused by the reports of the Congress of the Professional Photographers' Association, reference to this part of the R.P.S. show must be postponed to a later issue.

Below, Mr. F. C. Tilney reviews the pictorial section which, it will be seen, he specially commends for the balance between different classes of work which has resulted from the choice of the selecting committee.

MR. SOLOMON J. SOLOMON, R.A., ON ART IN PHOTOGRAPHY.

The exhibition of the Royal Photographic Society was opened on Saturday afternoon by Mr. Solomon J. Solomon, R.A., President of the Royal Society of British Artists. Mr. W. L. F. Wastell, the President, who was in the chair, mentioned that the first of the Society's sixty-seven annual exhibitions was held under the Presidency of Sir Charles Eastlake, who was also President of the Royal Academy. Mr. Solomon stood for all that was highest and best in English art, and on behalf of the Council and members he offered him a very hearty welcome. In his own opinion the exhibition was the best and most complete ever held in the Society's rooms. He paid a tribute to those who had undertaken the vast amount of work entailed in its organisation and preparation. Special arrangements had been made for showing the lantern slides and colour transparencies to the best advantage; there was better separation of sections, and an improvement in the lighting of the main gallery. On the general question on which Mr. Solomon might speak, it was his opinion that fundamentally the photographer and the artist had almost everything in common. They lived in the same world, looked up at the same sky, reverenced the same truth, and loved the same beauty, and each strove in his own way and by his own methods to express it to others.

Mr. Solomon spoke gracefully and encouragingly on the relationship between artistic photography and the craft of the professional painter. Both, he said, were out to make pictures. The essential laws of composition, including grace of line, balanced grouping, decorative spacing, and massing of light and shade, influenced the discriminating photographer as they did the painter. Photography did much to raise the general level of taste in this country. There were several ways in which the painter was indebted to photography, apart altogether from the use of it which was made by the incompetent draughtsman. For one thing, it increased the knowledge of anatomy, and made possible the accurate study of the quick movements of animals and birds. Painters and sculptors even in high places sometimes made their horses, for instance, perform anatomically impossible feats, and the public, and perhaps the critic also, passed this by unheeded because crusty tradition was a "die-hard," and new-found truth made slow headway when the scientific outlook was lacking. Photography also availed to quicken the art student's perception of corresponding tone values, which in photography, of course, were simplified to monochrome. The Dutch masters and a few of the Spanish excelled in their appreciation of these subtleties. Then, in these days of alarums and excursions, when it was often forgotten that the function of art was to grace life and not to astonish the native, photography, by holding up the mirror to Nature, should have a salutary influence. Ironically enough, "stunts" were encouraged by the critics as a protest against the "photographic outlook." He would like the critics to come to that exhibition and define what the "photographic outlook" was. After all, art was founded on Nature, and photography would always give the facts, however they might be recorded *à travers témperament*. Such was the glamour of passing fashions that only the other day he had to say to a young Academy student, "Remember that for you your eye is the lens of a camera." Ten years ago that remark would have hall-marked him as a hopeless Philistine.

Mr. Solomon then reviewed some exhibits in the galleries. He congratulated the organisers upon their catholicity. There was something to satisfy the most exigent of art lovers, and something to interest the scientist. Among the latter he instanced the photographs of giraffes in their natural environment, showing their actions in a manner which could never be seen in any Zoo in Europe. Among the pictorial works he was astonished at the number of convincing compositions. Members of the public had a good deal of prejudice against hanging photographs on their walls other than those which they had taken themselves; but the most cultured person need not fear to hang pictures like these in the best parts of his house. He referred particularly to Mr. Luboshey's portrait of Sir Henry Trueman Wood, which was to him an astonishing piece of work, giving even in monochrome a vivid suggestion of the colour and texture of the flesh and hair. It reminded him of a good Orchardson portrait, and Orchardson was one of the finest of our portrait painters. Among the colour transparencies he found evidence of much progress.

Some flower studies struck him as almost perfect, and so did a stereoscopic picture of gems, which made his mouth water. The colour prints he found to be charming productions, better, he thought, with their mere suggestion of colour, than if they had the complete colour of the transparencies. Altogether he agreed that there was a very close relationship between the painter and the artistic photographer. "We use the brush and you a machine, but you use the machine like a fiddler his fiddle, with great mastery, and the rest is a matter of taste."

A vote of thanks to Mr. Solomon was proposed and seconded by the two Vice-Presidents, Mr. Dudley Johnston and Mr. T. H. B. Scott respectively, and Mr. Solomon, after thanking the audience, virtually promised to lecture before the Society in the course of the session.

THE PICTORIAL SECTION.

Every year and in every department the Royal Photographic Society's Show grows better and better. This rather overworn formula is remarkably fitting in this case; for the R.P.S. has been most assuredly emerging for the last three or four years from the cloud under which it mourned so long in the past. It is, by sheer fortitude and high endeavour, living down the prejudice and misrepresentation which, Heaven only knows why, fell to its lot; and in spite of the disqualification of having no proper picture gallery in which to hold its shows, it continues to attract the work of the very best workers at home and abroad. Its indefatigable well-wishers labour for it with astounding enthusiasm and self-sacrifice, and this alone is what tells in the long run. They have this year made further improvements in the lighting by ingeniously screening the ceiling and frieze from the free light of the handsome lamps recently installed. This plan does much to mitigate the glare in the glasses covering the pictures. Nevertheless, the quality of the works and the comfort of visitors would be still more assured by omitting the glasses from the top line of prints, which are, after all, quite out of reach of any risk against which the glasses are a safeguard.

The Portraits.

Unlike our friends in Pall Mall, the Selecting Committee have not plumped for portraiture, but have limited it to less than 20 per cent. of the whole pictorial display, and of these Pirie MacDonald claims four. They are four very good ones, and though seen in this gallery quite recently, are as fresh and dominating as ever. They are "Frank Lawrence" (142), "William Rockhill Nelson" (145), "His Grace the Archbishop of York" (148), and "Dr. Frank Crane" (152). Near them hangs another of about the same scale by J. Van der Pant, who calls it simply "Man" (154). It is virile and artistic, and although on more ordinary lines than those of Mr. MacDonald, keeps its place beside them very well. Herbert Lambert also shows four, of which the most striking in artistry is perhaps the little girl "Mary" (67). The dark hair of the child supplies all the weight there is in the tonal scheme, and is well placed in the field; the dress is but a thought lighter than the background, but that subtle difference in tone makes the print a thing of beauty. "Arnold Bax" (10) looks to have more gentleness of soul than one could have imagined in the producer of those fearless dissonances which characterise a modernist's music. "Oliver" (100) is a quite young baby, nude, taken at about lifesize—a scale which seems a trifle beyond the occasion. Marcus Adams also gives us four prints—a most affecting collusion, evidently, amongst these professional magnates—"Patricia Mary" (56) is a dainty picture of a maiden in columbine skirts. "Love Sisters" (59) a perfectly beautiful idea in posing, shows two semi-nude children, one fair, the other and elder, dark, whose arm reaches round her younger sister. The lines of this little group have been studied to some purpose, and it is difficult to see how they could be improved. The quality of the print is likewise exquisite. The "Eldest Son of F. J. Loveday, Esq." (66), is still a youngster, and seems to be rather taken with the semi-nude idea. "Zara the Piper" (63) is a little girl, in a classic robe this time, seated against a plain piece of wall between two curtains. The pattern of her figure, with its uplifted arms holding a Greek flute, comes with a gentle strength of tone against this light background, in itself glowing and beautiful by reason of the gradation it holds.

Another work which stands out as being due to conscious artistic intention and effort is Miss Kate Smith's delightful "Florinda's Fan" (1). Light, airy, graceful and charming, this is deservedly put where it meets the visitor's first gaze. The posing has that touch of affectation which the subject demands. The corner of the fan melts into the light tone of the background, and in other ways there is a charming "come and go" of the tones at all parts without loss of reasonable solidity. H. van Wadenoyen, Junior, admirably fills the space in "The Quizzing Glass" (7), a gentleman standing and reading a document through a small monocle. A little less novel, but excellent nevertheless, is his "Portrait of Miss C." (2). Mention ought to be made of a capital portrait of a dog called "Winton" (3), by Mrs. G. Bontor. "The Squire's Daughter" (8) is interesting almost entirely on account of its being the work of two ladies, D. and R. Morter, who have made a most creditable show at the Salon. Had it not been for that fact, the present print would have challenged no comparison with the better work, "The Master of the Fox Hounds," who is the identical squire's daughter. However, the print has quality, and on its own merits deserves its place here. "Unseemly Mirth" (12) is a better proof of its authors' power of characterisation. It is a picture of a guffawing serving maid, and although hardly a thing of beauty, is distinctly an attractive print. The severity of the style adopted by Chas. Borup for his "Mrs. Frank Bailey" (16) is evidence of a chastened taste, not belied by the utterly different and very captivating "Little Sweetheart" (71), who looks smilingly over her shoulder like a little Lady Hamilton. Another rather severely handled portrait is "The Tartan Shawl" (9), by E. Drummond Young, a lady seated full-face. It is carried out with technicality above reproach. "Miss Cynthia Fane" (19) is Lionel Wood's only portrait here, but it is an uncommonly good one, with a fine pose and expression and first-rate quality.

Of the work of N. E. Luboshey it would be unreasonable to say that we never have enough, because there is no one who is so consistently working hard and doing the best work. In view of his amazingly successful X-ray work here, it is all the more surprising to find that he can take his place with ease in the front rank of artistic portraiture. We must submit then to his preference for the scientific section, realising that his ewe lamb in portraiture is better than any example of his exhibited elsewhere, and possibly his best of all. 'Sir Henry Trueman Wood" (21A) is a work that will be regarded as a classic in days to come. It is instinct with style and feeling. That it is triumphant technically goes without saying, and whether it be a matter of modelling, textures, quality, or character, ample satisfaction and increasing appreciation result.

J. Furley Lewis, who has done, it seems, with the life of a recluse, shows a most animated portrait of an engineer at work over his plans, and looking up with an air of apologetic powerlessness to lay down his pencil. The title is "'New Works,' L. and N.W.R., Euston (Richard Cooper, Esq., M.Inst.C.E.)," (50). Another lively and eminently capable portrait is that of "P. R. Salmon, Esq., F.R.P.S." (52), by Halksworth Wheeler. "Jim" (79), by Miss Doris Galloway, is dull but otherwise fine. But Miss M. Curwen's head of a middle-aged lady, whom one would have to get up early in the morning to "best," is particularly lively in its tones and expression. Miss Curwen calls it "The 'Daily'" (83), and has used commendable judgment in

getting her effect of the household terror by presenting her face in all but life-size, trimmed close, so that the "close-up" effect gives the impulse to surrender on all points. Another good type is Chas. Wormald's beautiful print entitled, very aptly, "From Boy to Youth—and so to Manhood" (87). The merging of shadow into background is a fine touch. Ralph Jones achieves a velvety dark quality in "Peggy" (140), and Gilbert N. Futcher, A. C. Jacobs, and A. Howard Garmston each send work of a high order.

Figure Subjects.

Almost a silhouette in the shaded rags seen against a blazing sky, "Watching the Flock" (17) is a very forcible piece of out-door genre. The old beggar-man who shades his eyes with his hand is a picturesque character, but the chief merit of this work lies in the sensation Mrs. A. Ralli gives one of merciless sunshine. Two men looking over a document together (45) offers an unhackneyed theme in posing, and Gilbert N. Futcher has made a good thing of his theme.

Dancers and athletes are still enjoying their day. They come as a connecting link between the stark nude and the fancy costume subject. The best, from the artistic standpoint, that we have yet seen is certainly the work of Drtikol, of Prague. "Kupferova as Dancing Star" (141) and "Kupferova as Egyptian Dancing Star" (112) are the cumbersome titles of two very luscious prints. But the first-named is far and away the better. It exhibits two figures of women—a Circassian and an Ethiopian, presumably, both beautifully posed with regard to relationship of tone, made possible by the white and dark skins of the ladies. The high light on the fair woman's torso is a superb culmination. Everywhere the shadows are marvellously translucent, though very dark, and the whole thing is harmonious, limpid, and rich. To look from this print to the "Athlete" (129), sent by Bertram Park, is to realise how much the beauty of photographic pictures is discounted by sharp contrast of a light figure against a dark background without any play of transitional tone. His "Study" (125) is the figure of an artist's model playing panpipes against one of the columns of the Earl of Carnarvon's now well-known classic summer-house. L. J. Steele exhibits the same thing except that he places the lady the other side of the column and alters the pose slightly in "La Sirène" (75). The beauty of these pictures is the physical beauty of the model, which is considerable. Nudes on a larger scale and without a setting of any sort are sent by C. Pollard Crowther and Dr. R. S. Lovejoy. These again have a great similarity in motive; both are "crouching," both turned the same way: but whereas the "Nude" (96) of Dr. Lovejoy fills the space of the print with a good sense of design, Mr. Crowther's "A Pose" (28) leaves much space that looks empty. In other respects his study will give more delight, for it is lit with skill and faultless taste, and it has the smooth, velvety texture that is a legitimate attraction of such a subject. The other has no modelling at all, but is a broad, big treatment which in its way is fine. A semi-nude boy between his mother's knees is another arresting print by Drtikol, called "Mother" (151). It has a fine design, not unlike a famous Madonna of Raphael, and, indeed, since there is a suggestion of a halo round the mother's head, we may take it that the idea implicated is a devotional one. No words can over-praise the splendid posing and fine choice of types in this remarkable work of art. We finish this section of work by a reference to Angus Basil's "Young Dancers" (46), a young man and woman in a pose recalling Russian ballet. The print has much quality.

F. C. Tilney.

TRADE EXHIBITS.

The vestibule and stairways at the Society's house are occupied, as in previous years, by wall displays by leading manufacturing firms. Messrs. J. H. Dallmeyer, Ltd., show some striking enlargements of sports and Nature subjects obtained with their large aperture lenses, and two delightful portraits by Mr. Herbert Lambert taken in soft-focus by the Dallmeyer objective.

The Autotypo Co. make their customary effective display of the technical and pictorial merits of carbon prints in the shape of results by the ordinary carbon process and by Carbro. There are several pairs of specimens of the latter process showing the remarkable quality of the Carbro in comparison with the bromide print from which it is made.

Messrs. John J. Griffin & Sons have some beautiful professional portraiture printed on their "Noctona" and "Goldona" papers: their contributors are Messrs. Charles Borup, Reginald Haines and Nixon E. Payne.

Messrs. Wellington & Ward present a very striking display of prints and enlargements representing the pre-eminent qualities of their bromide and gaslight papers, in particular the B.B. brown-black papers and the recently introduced Q-tone varieties. Seltona likewise figures here as a Wellington product consequent on the recent acquisition of the Leto Co. by the Elstree firm. Negatives, in every instance, are on one or other of the Wellington plates.

Messrs. Amalgamated Photographic Manufacturers, Ltd., show a striking collection of examples of work made with the plates and papers manufactured by their constituent companies by Mr. C. P. Crowther.

The exhibit of the Kodak Co. consists entirely of the highly pictorial portraiture of Mr. Hugo van Wadenoyen, in the shape of prints on "Kodura Etching Brown" from negatives on Eastman Portrait film. There is a further display by the Kodak Co., on the staircase leading to the first floor of the house. This consists of prints on Kodak "Royal" bromide paper from negatives made by Mr. N. E. Luboshez on the Eastman Portrait film at a demonstration of portraiture by artificial light given to the Society last winter. It is a series of fine portraits in the making of which no retouching has been done on either the negatives or the enlargements.

Messrs. Robbins, Manistre, the London Camera Exchange Co., Ltd., show the latest issue of their catalogue of second-hand apparatus.

On the staircase connecting the first and second floors of the house Messrs. Taylor, Taylor and Hobson show a remarkably fine series of enlargements from negatives taken with the renowned Cooke lenses. These are of sports subjects in rapid movement, football, diving, and motor-cycles, and demonstrate by their great scale of enlargement the remarkably fine definition of the original negatives.

Death of Mr. W. G. Lewis.—We regret to see the announcement of the death of Mr. W. G. Lewis, of Bristol, at the great age of 78. Mr. Lewis spent his early youth under Horatio Nelson King, the Court photographer to Queen Victoria, and himself was later appointed photographer to the Prince of Monaco. For many years he carried on his business in Seymour Street, his name being well known throughout the West of England. He had four sons, all of whom are photographers in various parts of the British Isles (one being Mr. H. R. Lewis, head of the "Bristol Times and Mirror" photographic staff) and two daughters.

Held Over.—Owing to great pressure upon our space this week by the reports of the P.P.A. Congress and Royal Photographic Society's exhibition, many paragraphs, letters, and answers to correspondents are unavoidably held over.

PICTORIAL WORK AT THE LONDON SALON.

In several respects one feels a haunting conviction that this year, at any rate, the Salon is making a little halt in the unquestionable advance it has achieved since it rose, phœnix-like, from the ashes of the old Linked Ring. Amateurs of landscape and subject-picture seem to be marking time, and there are no recruits to speak of. Perhaps the passing of the subject-picture or anything with a strong literary interest, is not so much to be deplored; since genre or anecdote is apt to lead the photographer away on to the quagmire of picture-building and faking. That is a pastime requiring supreme taste, skill, and knowledge as safeguards against artistic death; and not everyone is a Polak or a Guido Rey. But even Mr. Polak has at last done with his series of old Dutch Masters, with which he distinguished himself.

When landscape is considered, one must openly deplore the fact that the newest ground of artistic exercise, in which photography had set a firm foot, should begin to show signs of a waning attraction. One looks around the gallery only to see in great preponderance heads and figures that can only legitimately be classed as portraiture of that kind which is practised for commercial ends. It will soon be a misnomer to apply the term amateur photography to the London Salon Exhibition. Nor is the R.P.S. very different in this respect; since its recent one-man shows have been very much of the professional show-case order. What, then, is happening to the amateur? Enquiry elicits the information that the proportion of portraiture to other classes of work at the Salon, is practically the proportion of the entries. The fault, therefore, if we agree that it is one, is the amateur's own. He is giving place to the professional. Nobody doubts that the professional wants, and should get, all the encouragement he can on artistic lines; and if he is alert enough to get it by enterprise, good luck to him. That the effort is genuine is apparent in the fact that his "body" is arranging personally conducted tours of the national picture-galleries; and that is the most hopeful sign in trade since photography became a trade. But where, again, are the amateurs; they, whose souls are supposed to be above all thought and consideration of interestedness; who form clubs and societies for the encouragement of their art, the acme of which is an incentive to pot-hunting, amongst themselves and the dealers they support? To them, apparently, the picture-galleries do not appeal, at least I never, but once, heard of a camera club going to a picture-gallery, and that was only a private and informal gathering of two or three.

However, those who are still faithful to lofty ideals should be honoured; and it is my privilege to direct attention to their works.

One of the earliest exhibitors among amateurs is certainly Alex. Keighley. He has steadfastly persevered in a determined course of pleasing himself, and as his judgment is trustworthy, the process has been vindicated. His work this year shows none of the laboriousness that in former examples seemed to be necessary to produce a print. "The Castle Hill" (30) is free from obvious retouching, and is no less full of the romantic feeling that we look for in Mr. Keighley's works than the laboured prints have been. This one is a view of a ravine through which a gleaming river runs, and on whose sides grow the cypress trees. The sky is cloudy. Are not Mr. Keighley's skies usually cloudy? At any rate that of "The Turnip Field" (85) is effective because it has character and makes the picture. This is one of the finest subjects he has ever exhibited here. "The Fishermen's Shrine" (88) has the smooth quality of a mezzotint, and is but one degree less delightful than "The Turnip Field." "The Church Steps" (294) seems to be in want of more contrast in the tones; it is an enticing subject.

F. J. Mortimer sends, in my humble opinion, the finest landscape work he has yet shown, in "Storm Clearing Off" (71). It is in a beautifully light key, which is exceptional in Mr. Mortimer's sea work, yet the tones are rich. It has a grand and dramatic sky; the water in the bay is a turmoil of heaving weight; and the rocks are full of construction and detail, which is a change from the usual black lumps of under-exposure that coast scenes usually offer. "Solitude" (191) is the characteristic Mortimer of sea and clouds; but impressive and poetical.

J. H. Anderson does not surpass himself; that would not be easy; but he stirs our interest more than usual by some new and splendid subject-matter. I have often wondered when photographers were going to discover the unearthing of St. Magnus by the disappearance of the "Pearl" buildings, and who would be the first to do it; and, lo! it is J. H. A. His "Changing London" (126) is a clever piece of selection, made from the river level. The big barges beneath the bridge are admirable foreground stuff. The whole thing is rich in tone, and so fine in design as to make the true Cockney's heart flutter with pride. The other version, "Changing London" (129), shows the clearing before the church, and makes an equally effective picture though not so traditionally pictorial. It is dark, of course—these photogravures always are—but there is a delicious sparkle in its depths, and the handsome church tower is looking its best. I do not know how the monument got out of the vertical; but I know it has recovered now, for I saw it on Sunday last. Visitors should note, also, the sound art of "Riverside Works, Hammersmith" (146), and the technically accomplished "London Terminus" (149) with its sunlit crowd, also by Mr. Anderson.

Whilst speaking of London, mention should be made of Hector Murchison's very noble "Construction—London's New Town Hall" (39), fortunately photographed before the anti-climax tiled roof literally "put the lid on" what might have been a dignified structure. Mr. Murchison, taking a leaf from the book of Muirhead Bone, shows us the charm of scaffolding, and secures one of his finest subjects. The antithesis in subject matter is chosen by Charles Job, who deals with the past glories of the Renaissance. "In the Garden of the Villa D'Este" (46) cannot be called a new find, since it is the most be-painted of any of the Italian gardens, and deservedly so. Mr. Job does, however, get a rather new point of view in confining himself to the stairs and vases, with which he makes a picture magnificent in design, and adds to it all the delights of colour, texture, and historical romance. Similar qualities exist in P. Dubreuil's "Dream's Garden" (412), which looks like the cascade of St. Cloud.

London, again, has inspired W. H. Reece and Ward Muir. The first shows Hyde Park Corner, with a true atmosphere in "London Landscape—A Rainy Day" (58), and the latter "Cannon Street Station" (59), with true daylight, and a new view (for which many thanks) from the river level. A rainy day in Venice is something new in pictures, and Chas. A. Davies intensifies the effect by his fuzzy treatment of "The Piazza San Marco" (233). In S. Bridgen's imposing view of "The National Gallery" (282) natural effect is dominated by pictorial effect. He has given the dear old place the majesty it possessed before it was overtopped by the gaunt hotels on the south of the Square; it is an eminently happy selection.

Natural effect in landscape is not a strong feature of the show this year, but a notable example is set by J. Arthur Lomax in "Sunlit Yard" (18), which really dazzles by the glare on the white walls. A. C. Banfield uses a similar theme, but with a less intense effect, in "A Corner of the Farmyard" (35). F. O. Libby's "Nocturne" (64) is a blue-tinted print in which respect, as in its general design, it is obviously a sincere form of flattery of Whistler. His more photographic theme, "The Curving Way" (94) is perhaps more commendable on this account, though it is decidedly fuzzy. This gentle- is evidently a favourite with the Selecting Committee, having ten specimens of his work on these walls. An extremely fine effect is depicted in a landscape by W. J. Clutterbuck, who

ennobles it with the impressive title of "Winkles" (65). On the other hand "Le Val D'Estang' (117) is a high-sounding phrase that fits exactly the romantic and imposing mountain scene sent by M. O. Dell.

Photographs of landscape owe their finest laurels to natural effects. However fine the composition, a touch of weather, let it be hail, rain, or shine, gives it a content which has a universal appeal. The argument is borne out by J. M. Whitehead's "Rain on the Hill" (280), "The Mosque—Moonlight" (112), by F. de la Mare Norris, Dr. R. S. Lovejoy's "Nocturne—by the Sea" (144), with its moonlight on the water (I say nothing of the empty silhouettes of the foreground trees), and his even more subtle "New England Nocturne" (188) with the exquisitely true tones of moonlight on snowy roofs. Bertram Cox's "Storm at Brentford" (246), the remarkably fine and simple weather-piece by J. A. Lomax, which he calls "Cloudy—probably some rain" (250), which is one of the few great landscapes here, Dr. R. E. Evans's "The Shadow of Night" (288), and "The South Downs" (295), by Chas. Job, with its magnificent sky. All such works, showing observation and love of Nature, profit by the quality of variety of tone brought about by their respective motifs, even when it is the gentle effect of lighted windows, as in the successful "Evening" (60) of Oskar Teiwes.

A few prints give that mysterious dignity which always impresses a spectator, such as the immensity of the iron vessel in Mrs. Milson's "In the Graving Dock" (407); the big trees in Bertram Cox's "Evening Shadows" (201), a picture truly in the great style; and the castled hill in "Bamboro'" (272), by J. McKissack, who has perhaps over-corrected his sky at the expense of luminosity. His "Wassemot" (38) is beautifully simple in its massing, and of exceptionally nice quality, but the subject is a little elusive—plain walls, a flight of steps and some dark blocks of stone upon which a woman stands—a highly artistic picture of nothing in particular, which everybody would like to possess. This is art for art's sake.

It is interesting to turn to the opposite method and see what charm of laciness H. Felton gets in his very pretty and elaborate "Sunshine and a Bridge" (251), or L. Misonne in his soft and almost too melting misty pastures. There is no doubt, however, that the mistiest, "Lumière Frisante" (202) is the best in some respects, for it is a truly observed light effect, and a charming subject of trees beside a little brook and figures on the path. A much firmer tone supplies the remarkable quality of T. H. B. Scott's "Bruges" (207), whilst in "The Towpath, Guildford" (199), by A. C. Banfield, we get the full strength emphasising the lines of a low bridge which are the motive of the design. Another river or canal scene by T. B. Blow, "A Relic of the Past" (252) is very engaging. Nor should "The Seine at Caudebec" (340), by Chas. H. L. Emanuel, be missed, which with "Honfleur—Low Tide" (342) will widen the scope of his work in public estimation. "In Lowestoft Harbour" (362), by G. Brown, should be recommended also for its splendid subject; likewise John Keene's "Polperro Harbour" (414), in which one thin sail puts the finishing touch to a good composition.

Fred Judge sends three of his beautiful oil transfers, "Holy Loch" (388), "The Pavilion—Night" (389), and "Moretonhampstead" (390), but he has not yet surpassed his first efforts in this method.

It is nice to see that C. Puyo contributes again. His works are "Le Bain" (44), "La Fontaine" (118), both of which are highly pictorial, especially the latter with its stone pine or cedar overspreading the well-head. The third "Vers la Source" (72) is perhaps less taking, pictorially, and some may think that M. Puyo's sharp and incisive lines, and clear cut tones, are overdone in this case. But I think this idea would be due to the environment of photographic tone, so frequently sodden, lifeless, and monotonous. M. Puyo works like an etcher. He delights in healthy "snap" and accent; and his method in no way sacrifices quality or luminosity; for the sky in "Vers la Source" is brilliant. Herbert Bairstow works much in the same style, and, as it happens, his "Sand Dunes" (260) is similar to the last in subject except that there is no Algerian water-carrier in it. But Mr. Bairstow has, perhaps, even more quality. He supplies a *liaison* between the needle-stroke etching-quality of the grass-tufts and the open light spaces. Thus he is able to bring his tones more naturally to the culmination of the brilliant glare of the sand, without missing any of the grip of the light and dark accents.

Francis Jay has always specialised in the nude, as an accessory in landscape, and here he repeats the process, having reduced his figures almost to disappearing point; so that "The Mermaids' Rock" (26) and "Styx" (166) are in reality landscapes, proper; and fine, wild rock scenes they are. But we are not without the nude as she is photographed, thanks to the Earl of Carnarvon, Nickolas Muray, C. A. Bromley, and others. The most fleshily nude is a print in red, which looks like a beautiful drawing, by C. Scarabello, "Nude Study" (50). The noble Earl's "Spring" (124) is a figure with an astral envelope, due to a soft-focus lens, which also makes the sunlight amongst the bushes very flecky and globular. But when one compares the identical subject at the P.P.A. shown by Bertram Park, done in a "tight' method, there is something to be said for his lordship's lens.

A few other figure studies demand attention and appreciation, particularly Mrs. Barton's original baby on its mother's lap, "Shadow Play" (145); J. Capstack's capital character piece "Alphonso Wing" (164); N. Muray's beady-eyed "Ruth Draper" (175), which mesmerises one; the splendid posing and arrangement of Lionel Wood's "Friends of the Footlights" (255) and G. Lynde's lady with downcast eyes called "Portrait" (258).

In genre work Janet Allan and Agnes Martin work in a clean, precise manner, and get truth and interest into their figures. They send "Scandal" (137) and "Fortune Telling" (257). Lewis A. Banfield shows an old Indian gentleman apparently carving his toes, "The Concentration of Sunda Singh" (221) "Le Lever des Petits" (329) is an animated interior, by A. Bologna, that reminds one of Van Ostade, and A. F. Kales places a figure of a musketeer very effectively in an archway in "The Cardinal's Guard" (384), though the livery is surely that of Louis XIII. not of Richelieu. A little earlier in history comes his "Lady of the Tower" (109), a mediæval person on a long, winding, outside stairway. A wonderful study of creeping light and depth of perspective in the shaded parts comes from Louis Fleckenstein. The figure here is that of a native standing "In the Patio" (181). Other outdoor figure subjects are three clever snap-shot enlargements by G. F. Prior, a market group "Idle Moments" (165), an ex-servicemen's band, "London Street Harmony" (214) and "Farringdon Road" (266), men at a book-stall. A splendid mob of orientals is sent by Capt. G. J. O'Brien, called "The Moharram" (313), and one of the best stage photographs I remember to have seen is Miss F. Vandamm's very clever "Columbine, Little Theatre" (353)

Architectural interiors scarcely exist, but J. R. H. Weaver saves the situation with his wonderful view "In Avila Cathedral" (110) which perhaps loses a little poetry by a too searching presentment of every feature.

Engr.-Comdr. E. J. Mowlam still supplies reminders of the war with his various battleship subjects, and even still-life is represented by two examples, Ranald Rigby's "Old Pewter" (12) and C. Lederle's "Fruit" (212). They both have fine quality, but the latter has the extra distinction of overcoming gravitation.

F. C. TILNEY.

A SOCIETY FOR STOCKTON.—A movement is on foot to establish a photographic society at Stockton At a well-attended meeting held last week, Mr. T. W. Kelley, president of the Cleveland Camera Club, delivered an address, and a provisional committee was appointed. Further meetings are to be held at the Adult School, Dovecot Street.

THE P.P.A. CONGRESS.

In the present issue we publish a further report of the proceedings of the Professional Photographers' Association's Congress which ended last Saturday with an advance private view of the exhibition of the Royal Photographic Society. Perhaps the fixture which was of chief importance from the practical standpoint was the demonstration of "Unusual Portraiture" by Mr. Charles Aylett, of Toronto, despite the fact that he had to work under conditions and with apparatus to which he was not accustomed. A report of this demonstration is unavoidably held over until next week. A short address by Mr. Herbert Lambert, of Bath, on the Wednesday afternoon underlined a point on which we have often written, namely, that many photographers who jealously guard what they think is a valuable secret are cherishing something which is universally known. Mr. Lambert mentioned that a photographer in a little town revealed to him, under the most solemn pledges of secrecy, that he had hit upon a wonderful new thing. The "new thing" proved to be Eastman Portrait film. Mr. Frank Brown referred to some of the unscrupulous practices which were adopted by some photographers in their efforts to obtain business on the strength of the reputation of established studios.

Mr. Pirie Macdonald's address on the Wednesday evening was a vigorous appeal for a wider interest in the intellectual pursuits of the time on the part of photographers and for a greater determination to realise their own ideals in their work.

The assistants' evening was a successful function, at which Mr. George Hana expressed the hope and his own desire that a way should be found to bring assistants within the Association. The president made all feel at home.

CO-OPERATIVE ADVERTISING.

At the meeting on the afternoon of Wednesday, September 13, Captain F. H. Wright, of the London Press Exchange, addressed the members on "The Co-operative Advertising of Portrait Photography." He said:—

Co-operative Advertising—What is it? What has it accomplished? Can it be used to promote professional portraiture? These are the three questions I propose to deal with as shortly and effectively as possible.

Co-operative advertising is the application of the principle of co-operation to the force of publicity. We all know the usefulness and power of modern advertising. It is part of modern life, and we are conscious of its suggestive influence all around us. A great authority on the power of publicity (Lord Burnham) said the other day: "Advertising is the key industry of the universe. It opens every door. It leads through the street to the market place, through the market place to the home. It is the fine literature of trade, and the illumination of business."

Now in America, many years ago, it was realised that there was in many industries a great deal of educational work that could only be done by the industry as a whole rather than by its individual members. The recognition of this fact led to the start of all those great co-operative campaigns, amounting to nearly 200, which are now carried on in the United States.

The fundamental idea behind a co-operative campaign is "the greatest good for the greatest number."

It calls upon the individual members of an industry to co-operate together, each contributing his share to a common fund for the good of the whole industry, to achieve a common purpose which, as individuals, they could not hope to do—indeed, in many cases, could not afford to do.

Most of these co-operative campaigns have been initiated to enlarge the market and increase the demand for some product. I will mention only a few—Apples, peaches, raisins, walnuts, oranges, lemons, grape fruit, cheese, eggs, milk and cranberries; manufactured goods include millinery, macaroni, woollen fabrics, linen, gas, granite, bread, bricks, books, bicycles, paint, linoleum, and even the coffin makers have banded themselves together—not, of course, with the benevolent object of increasing the use of coffins, but to educate the public to a right appreciation of the sympathetic and delicate service performed by the undertaker in the trying time of family bereavement.

This advertising of an idea or a service rendered by one portion of the community to another is no new thing in America. It carries with it a social service of the highest order. We find the printers educating their craftsmen to produce better printing, and the public to appreciate their efforts. The optical people have urged the importance of the care of eyesight. The paint manufacturers, with their "Save the surface" campaign, furnish a splendid example of educative advertising—the whole industry grouping themselves together for the purpose of teaching the community the protective value of paint. Bankers have organised themselves together for the purpose of inculcating the habit of thrift. For instance, our own Government are now spending thousands of pounds in just reminding people to buy Savings Certificates—thus proving the necessity of reminding people to do the most obvious things: and during the war it was found necessary to spend money in reminding people to serve their country in the time of great danger.

These illustrations—which I could elaborate indefinitely, had I the time—will give you some idea of the wide field covered by co-operative advertising. I cannot recall a single case where co-operative effort has been attended by anything but the most overwhelming success. The Californian Fruit Exchange—which was the pioneer of this form of advertising in the States—has nearly trebled the consumption of oranges since the start of the campaign. The consumption of walnuts has been doubled every three years, bringing them into steady use through every month in the year. And so on through the whole range of products so advertised.

Now to come nearer home. The first great co-operative campaign undertaken in this country was that great co-operative effort for which the British Commercial Gas Association was formed.

In a commercial way the problem of the gas undertakings of London and the provinces was not unlike your own professional problem to-day. Before the war the gas undertakings were making as much gas as the public appeared to want. They could not afford to advertise individually because the area any one company could serve was limited strictly by the area covered by its gas mains.

Further, it seemed impossible to increase the consumption of so necessary a product as gas. People used as much as they required and no more. If they wanted more it was there for them to use. They didn't want more. Nevertheless, the gas undertakings the country over formed the British Commercial Gas Association for the purpose of advertising the uses and advantages of gas for domestic and industrial lighting, heating, cooking and power.

It was a bold experiment, in which the organisation of the London Press Exchange played a leading part. Could you find any product more difficult to advertise than gas?—it seems doubtful, but it was done. And what has been the result? In spite of the fact that almost every new house that is built is wired for electricity, the consumption of gas is steadily rising. In 1918—far from a prosperous year, you will remember—the normal increase in the consumption of gas was accelerated by no less than 13 per cent.—an enormous figure for a commodity like gas.

Take the case of the Scotch tweed industry. Here an association of forty manufacturers of genuine Scotch tweed formed themselves into the Scottish Woollen Trade Mark Association, and advertised the merits of genuine Scotch tweeds, made in Scotland, of pure new wool. It was an attempt on the part of these manufacturers to protect their industry from the competition of English and foreign tweed manufacturers who had imitated the traditional Scotch patterns, but not their quality. There is no need for me to go now into the inner workings of these trades or their methods. It is enough to say that the advertising has been astonishingly successful. So successful that Scotch tweeds have become definitely the fashionable thing to wear for the past two seasons. You have never seen so many Scotch tweed suits and overcoats and women's coats and skirts worn before.

Again, this year, largely through the instrumentality of the London Press Exchange, the British-Grown Tomato Industry embarked upon a considerable advertising campaign to increase the consumption of tomatoes. Again it is a prosaic commodity that was advertised. Let me tell you that one single advertisement in that campaign produced no less than 14,000 requests from the public for tomato recipe books.

Post-war conditions have brought new problems, and individual members of industries have found themselves faced with entirely

new difficulties—shifting values, restricted trade, and in some cases the total disappearance of hitherto profitable markets. Where the problems are common to the industry as a whole, the remedy is to be found in co-operative action by all the members of the industry. More especially is this so where the object is to enlarge the market and to create new consumers. It is not surprising that in many industries leaders who have courage and wideness of vision find themselves turning to co-operative action for the purpose of solving the pressing problem of the age. If the war has taught us nothing else, it has taught us to recognise our interdependence upon each other, and the value of unselfish co-operation for the common good.

However, enough has been said of the value of co-operative effort as applied to advertising, and the question arises—Can you make use of it in your profession—is it wise or right that you should do so?

What is your problem? It is that not enough people are having their portraits taken. It is a big question, and on its solution depends the prosperity of your profession as a whole. Yet the answer is of the simplest, and can be put into very few words. It is that people simply do not think about it, and no one ever reminds them. And they are hardly to be blamed for forgetting it.

Life is now so complex, so many are our necessities and needful luxuries, so insistent are the cries to buy, to buy—that it is not so strange that it should only occur to the average person once in ten years to have a portrait taken by a professional photographer. At the moment I can only think of one time in the life of the average individual when he is seriously reminded of the necessity of portraits—and then it is brought home to him in a rather melancholy way—when he realises for the first time that someone dear to him has passed over without leaving behind him a solitary portrait of himself.

I suggest to you that if the public were steadily and consistently reminded, not of individual photographers, but of the desirability of having their portraits taken, I think you would find you have solved your problem in a simple and dignified way. The advertising must of necessity be collective—must be done skilfully, with dignity and restraint; that is the only way advertising can be employed by your profession.

And now you will want to know something of the cost of the right type of campaign for your purpose.

At a fair estimate, there are 8,000 professional photographers in the country. There may be ten, but we will accept the lower figure of 8,000. Supposing only a portion of that number have sufficient courage and breadth of vision to perceive the possibilities of this scheme: say 4,000 professional photographers from whom we may confidently expect contributions. Naturally the big man with a big connection or following should contribute more than his smaller brother, since he will be likely to derive greater benefit from the advertising. It is proposed, therefore, that the contributions should be either £2 10s., or £5, per head, per year, according to whether the rateable value of the contributor's premises exceeds or falls below a certain arbitrary figure to be fixed later. We may suppose that of that 4,000 contributors, 75 per cent. will fall below the figure mentioned. That would give us 3,000 contributions of £2 10s. and 1,000 contributions of £5, making a total advertising fund of £12,500. Large as this amount may appear to be, it is none too much to carry out such a campaign as you will require.

Then you will say: All this will be to the great benefit of manufacturers of photographic materials. Well, gentlemen, the manufacturer is first and foremost a business man. And when you, as the authors and controllers of this scheme, approach him and invite him to give his help, I believe it will be forthcoming, and in no half-hearted fashion either. If the manufacturer, by according to such a campaign liberal help, is going to make success certain beyond all doubt, he will do it and do it quickly. I will give you an instance. In America the Kodak Co. have been themselves conducting a campaign in the Press on similar lines to the one we have suggested in our booklet. It has been a great success, and local professional photographers all over the States have taken advantage of the national scheme by linking up with it their own localised advertising.

Consequently, it is inconceivable to me that there is any doubt that you would have the strongest support from the manufacturers of this country.

In conclusion, may I suggest the best method which our long experience has taught us is the right one to employ in the starting of a co-operative campaign by an association?

First of all, you should, as an association, at the largest meeting possible pass a resolution in favour of a co-operative advertising campaign; that a scheme be adopted, and the funds raised forthwith. This being agreed to by the meeting, you should, then and there, appoint a small publicity committee of businesslike men, investing them with all necessary powers and authority to proceed with the launching of the scheme.

It is necessary and advisable at the start to appoint the best firm of advertising agents that you can find for the purpose of carrying through your scheme. It is essential that your advertising should be planned by a firm with great experience of co-operative campaigns—one which is accustomed to bearing in mind the fact that the interests of a whole profession are concerned, and that the funds to be administered by the Publicity Committee are in a sense public funds, and must be expended with wisdom and discretion and with due regard to economy: in other words—in the best interests of every member contributing to the fund. I might also add here that if the advertising firm has, in addition, a knowledge of the photographic business and the advertising of photography, it will be of undoubted advantage in working the campaign. For instance, the London Press Exchange, in its long association, extending over twenty years, with Messrs. Kodak, Ltd., as advertising agents, have naturally gained a knowledge and experience which would prove of inestimable benefit to you in the prosecution of your own campaign.

There is just one more point I should like to touch on, because it is always the subject of a question in the starting of these campaigns, and that is, what do the advertising agents make out of it? The remuneration which the agent receives is a fixed commission paid by all the newspapers and billposting contractors throughout the country, and is only paid to properly accredited agents—it is never paid to anyone else. For this remuneration, we do all the work of planning and carrying through the campaign, and indeed, do a great deal of the heavy organisation work necessary in starting a co-operative campaign. In the first years of a campaign we have found, as a rule, that the amount of work we are called upon to do is usually out of all proportion to the remuneration received. This does not trouble us, for, convinced of the essential soundness of the scheme, we are content to take the long view and await the development which comes later for a fair return for our early labours. The administration expenses of a campaign such as yours will be infinitesimal, and so far as the advertising is concerned you can assure your members that every penny subscribed for that purpose will be so used.

If you decide to embark upon a campaign for the good of your profession, I prophesy that, providing it is conducted properly, you will reap a well-deserved success. You possess the knowledge, the enthusiasm, and indeed, the profession as a whole is imbued, to my mind, with a rare and precious vitality; and were it not so, such an exhibition as this could never have been brought into being.

One outstanding result of this campaign is inevitable. It will have the result of immensely strengthening this Association and increasing its membership, and as the campaign develops and the advertising appears, the co-operative effort so displayed will not only create an added bond of fellowship between you as members, but the advertising itself will be a source of pride to all the craftsmen who stand behind you and who play a part, however humble, in the production of the works of art and beauty which are so essential a part of our social life.

In the discussion which followed Captain Wright's paper, the Chairman suggested that the matter be left to the Council to consider and report.

A member pointed out that as subscriptions would be optional, those who did not contribute would equally reap the advantage.

Mr. T. Bell, in reply to the Chairman, said that the number of photographers in the United Kingdom was somewhere between 8,000 and 10,000.

Mr. Marcus Adams suggested that those in the room who were willing to subscribe £5 a year should hold up the hand. He also suggested, as a means of discriminating between the big man and the little man, that 10s. a year be subscribed for each assistant employed.

Captain Wright, in reply, said that the suggestion with regard to the non-contributing people who received an equal benefit cropped up every time. There was nothing in it at all. Here was a clear-cut proposition which was going to be for the good of the whole

industry. The people who did not come in could quite well be ignored. These people would gain financially, but they would lose morally. In every trade and profession there were a sufficient number of clear-sighted and unselfish men of vision who were prepared to start such a scheme and make it go.

After some discussion as to the value which any resolution of the meeting might have, the simple proposition that the scheme be referred to the Council, who would report upon it to the members in due course, was put from the chair and carried by a show of hands, apparently without dissent.

On the Friday afternoon, after the Statutory General Meeting, a lecture was delivered by Mr. Hopton Hadley, also on the subject of "Co-operative Advertising." The President occupied the chair.

Mr. Hadley said that he preferred to call his address by the title, "A Scheme for Bigger Business for British Photographers." Now that the Association had attained its majority there was man's work ahead of it. Everyone was aware of the fact that conditions of business had greatly altered, and these changed conditions called for changed methods. He would suggest as a motto of the new era, "Each for all, and all for each." No particular individual could do very much to extend the public appreciation of professional photography, but, in combination, work could be done which would be really full of results. He alluded to some wonderful work which had been done by co-operative advertising to create prosperity in other trades. The first example was that of the Californian fruit growers; the raisin growers alone in California this year were spending many thousands of pounds in advertising the season's crop in the United States. The co-operative effort of the Irish linen manufacturers had had a very successful issue, and he believed the same was true of the Scotch tweed manufacturers, the tomato growers, and others. In the States a florist conceived a very effective slogan: "Say it with flowers," and out of that simple and poetic expression quite a large concerted movement among florists had developed.

The profession of photography existed not on sentiment alone, but on self-esteem, and to bring about the proper psychological attitude on the part of the public called for co-operative movement; it was more than one photographer could do. The wonderful thing about co-operative advertising was its small individual cost. The tomato growers secured their results with a contribution of one-twelfth of a penny per pound sold. The method of raising the money was the main problem, and he was indebted to Mr. Marcus Adams for the practical suggestion that there should be a contribution of ½ or 1 per cent. on all one's trade purchases. Having agreed upon that part of the programme, why should not the manufacturers be got to contribute a like sum? This would make the ½ per cent. into 1 per cent., or the 1 per cent. into 2 per cent. A fund of £4,000 or £5,000 would do wonderful work. The splendid press notices of the present exhibition were a kind of foretaste of what might be achieved. A part of the programme might be to have provincial exhibitions of the works already shown in London. He had noticed a reference in the Press to "the new fashion in photography." Whatever the new fashion might be, it was helpful to them as professional men. A new fashion should be created each year if possible. Shakespeare spoke of the seven ages of man, but how much would each person present that day appreciate a series of photographs of himself taken at more frequent intervals than those separating the seven ages! He also suggested active measures to create business in connection with the Christmas festival. Why not a co-operative effort to introduce the custom of photographic Christmas cards? A few well-chosen papers as the media for advertisements would work astonishing results. He mentioned especially the illustrated daily and Sunday papers, which were read so largely by women. A regular Press campaign, supported by judicious and timely paragraphs, might be instituted, and connected up with bulletins in the studio window. His purpose that day was simply to familiarise his audience with the idea of co-operative advertising for the individual and the common good.

Mr. A. Barrett asked whether Mr. Hadley considered that all exhibitors should notify their local Press of their exhibits; also whether it would be possible for him to work out some kind of scheme for the consideration of the Council, the scheme to include various advertising methods, through the Press and by means of the shop window.

Mr. Mills asked whether it was really possible to raise sufficient money to advertise to any appreciable extent. The lecturer had mentioned the possibility of getting up a photographic boom at Christmas time, but what was wanted was some means of enlivening business in the spring and early summer.

Mr. A. Bennett asked whether the lecturer favoured hoarding advertisements?

Mr. Hadley, in reply, said that he thought the exhibitor who did not try to get it mentioned in his local Press that he had had pictures accepted for a London exhibition was wanting in enterprise. As a rule, the local Press was only too pleased to publish the fact that a townsman had obtained any distinction. He wished to make it plain that if this co-operative movement were entered upon by the Council, specimen advertisements, window bulletins, and show cards would be first submitted to them. Nothing would be done without the Council's approval. Mr. Mills had questioned whether it was possible to raise a sufficient sum of money. But even a small amount would do for a beginning, and as experience was gained, and results became evident, larger amounts would be secured. There was a possibility of getting larger donations from wealthier members of the profession or from the manufacturers. One effect of the scheme would be largely to increase the membership of the Association, and to double the membership would be no small result; but beyond this, there would be very large increase of individual business. Advertising was unlike any other kind of seed-sowing, for it could be sown to harvest at any time one pleased. As for hoardings, he was not in favour of them. They were the special medium for goods that were sold at every small shop, and photographers needed to create, by more subtle methods, a public appreciation of their work.

A hearty vote of thanks was accorded to Mr. Hadley.

ADDRESS BY MR. PIRIE MACDONALD, OF NEW YORK.

On the Wednesday evening of the Congress Week the chair was taken by Mr. R. N. Speaight, who, in introducing Mr. Pirie Macdonald, said that his work as a photographer of men was world-famous. But although his work was of the highest artistic character, he also held to his record the highest number of awards ever given for technical photography in the United States, if not in the whole world. That was the backbone, the speaker believed, of Mr. Macdonald's great success.

Mr. Pirie Macdonald, who was enthusiastically received, said: I am glad to have so sympathetic an introduction. A while ago a man introduced me who knew nothing about me, and he handed out a reel of stuff which made me realise how difficult it would be to impersonate my reputation. (Laughter.) But our friend, Speaight, has been kind, and has put me down as what I am—just a workman. I have no other claim to any celebrity whatever, except that of a workman.

In talking to you to-night I want you to realise that I am talking to those who are of my own kind. I am talking to the middle-class of our people. I am talking to you not as Britishers, but as though I were talking to a set of Americans of the kind that I have sprung from, with the idea of trying to give you a bit of the result of the experience of life that I have had. And I am not going to preach.

I have a strong feeling that only a short time ago we were going very wrong, that we all found ourselves deeply involved in business —desperately involved in business. And we were people who were making a claim before the world as artists, and the business was occupying all our attention. Time was when, all through photography, with you as well as with us, we found ourselves so involved in the necessity for money that we were doing many things in an abominable way. It was due largely to the fact that we—the whole world—had grown to a rut where we had lost the essential facts of freedom. We in America, and you in England, were in exactly the same boat. We got to the place where we did not ask friends at night in to have a snack; we were not content with a little beer, some cheese, and a pipe. No; it would not do. It was a condition of mind, and if by chance what I happen to say does not fit *you* in detail, change it to your own key. Dinner was at eight o'clock, and we had to put on "glad rags." If we did not, our neighbours would feel that we were not quite fit. And we got so that wine was necessary instead of beer. We got to a point where we taught our cooks, and, when we should have been glad if they had known how to broil a chop properly, to do things with French names. Instead of plain water on our tables we had Perrier or Apollinaris. We got to a place where, unless we sported a car—I am not speaking of owning a car, but of sporting a car—we were not quite fit to associate with people who did. And many of us were not able to afford the car we sported. Then we went on, and, you know it as well as I, in England we went on to hotels that were filled with German waiters, instead of stopping at

the little, old wayside houses where we used to get a meal off the joint for two-and-six. Oh, no, we had to go to these palace hotels because they were the proper place for a motor-car to draw up against. So we found the whole thing going on and on, and harder and harder, and faster and faster, and the trouble was, you know, that we were doing things we were not quite fitted for. (Applause.)

The real and essential trouble with this life that we had been leading was that, as professional men, it made us do things we should not have done. The overhead and the upkeep of our houses were greater than we had capacity for handling. There are here men who are captains of industry, and I am not talking to them; I am talking just to the ordinary type of man that I myself have come from. Many of you, like me, had originally only a bit of talent, and we found that as we enlarged our establishment it was necessary to work faster and harder. After a while, because we had this larger establishment, we had to do things that seemed not quite legitimate in order to keep the place filled. We had to work all the time. And that meant that we were turning out things that did not have the love in them. That is what I mean, and when you do not have time to stop and put love in what you do, you don't have freedom. The only reason I am here to-night is to give you the idea that there is more in freedom than there is in anything else on earth. I think that photography needs an awakening to the fact that many of us are not free to do what we want to do. There are many of us that have not had the chance to do the work that is worth while. There is many a man here who knows that since he has become successful in the eyes of the world he has had no time to hear music as he wanted to. There is many a man in this room who has never been in that marvellous storehouse of the treasures of the world that you have in Trafalgar Square. There are men in New York who have never been in the Metropolitan Museum of Art. Many photographers who buy gas for two motor-cars never feed their souls. They are doing degrading work. They are not doing things that have the divine in them. It reminds me of a sign that was on the wall of the little tailor's shop near the railway station: "Leave your clothes for pressing on the way to business, and call for them on the way home." (Laughter.) That man merely expressed the whole tendency of the time. The absurdity of it did not strike him. He merely wanted to get into the minds of passers-by the fact that they were in a dence of a hurry, and that he was the man to assist them. That same kind of absurdity has gone on in our places. We have been doing exactly that kind of fool-stuff because we have been crowded overhead, and because down underneath we were dissipating our money, which meant our energy.

Then came the war. The most carefully devised schemes for the continuance of this foolery of ours were shut up and gone. In an instant society was re-arranged. People dropped out who had been long on our level, and other people came and stopped for a minute or two on that level, and either stayed with us or went on to where they are now making themselves absurd. But one thing the war did in the way of good—and it did very little—(hear, hear)—for we find that international law is in ruins; but one thing good that it did was to give us a chance to stop and review the thing coldly. We were divested of our business, of our usual interests and habits, and the opportunity to pursue them. Some people stopped; other people merely bated their breath for a minute or two until the tide came in, and then they started in on the same thing again. What we should have got out of that pause was to take that which was good that we had in this former life of ours, and leave behind those things that failed.

The worst blunder of the pre-war days was the assumption that education was merely a means towards material prosperity, that anything that was worth acquiring should be capable of being turned into pounds, shillings, and pence. It was the worst blunder we made. I do not want you to get the idea that I believe all these creature comforts to be traps of the devil. But I do mean that the price you have to pay for them is sometimes too high.

There are two kinds of photographers. The first are those who really know how to do things, who have the basis of technique, the culture, and the capacity, and the second are the "bag of tricks" men who have only a few little stunts. You can expect one of the latter to want to turn his tricks into pounds, shillings, and pence, like a showman. But it is the other kind of men I am talking to. It is the other kind of men who are in danger to-day of getting under the ceiling that is too low for them, and always having to bend their neck to the requirements. The trouble was that, owing to the necessity of the case, our education became a something that was not real, that was not cultural; it became too thin. It got so that portraitists in their hurry would mistake characteristics for character—if you know what I mean. The genuineness which prompts a man to make great portraits was taken away by his desire to keep his head financially above water.

It looks quite a lurid sort of picture in retrospect. The trouble was that people, instead of wanting to know the hearts and brains of men, were always asking for some knowledge about a photographic process that could be turned into money. Instead of wanting to know what the man was, in order that they might be able to put down that which was essential and true, they found only time to look at the outside of his face, and if they could make a good map of that and could sell it, it answered. You know that that is far from being the best that we can do.

You will say, "Well, what about it?" Only this: we have got the chance of beginning over again, and before things become too involved again, before business gets too big again, before we overreach ourselves again, to get time to acquire culture, to get time to live up to our own ideals, and not those of our neighbours. I could shriek that at you, not the ideals of our neighbours, *but the ideals that are our own.* (Applause.) How are we going to do it? It means, of course, starting at the bottom and cutting down living expenses in order that we may be simpler. That does not mean just going home and taking it out of the wife. (Laughter.) That is not fair; it is not the thing to do. You have to play fifty-fifty with the old girl! It is a thing that has to do with your soul; it is not a matter of money merely, not a matter of saving some more money, or of preventing some money going. No; it is something that is to bring about ultimately your freedom, and you have got to have a square deal at home. And she will help you. It means the reduction of the extravagant end of your studies. I am speaking only of those things which you are incapable of actually handling and seeing yourself. It means the keeping down of "overhead," so that you get the time to think. How many of you, I wonder, really do take off a bit of time in which to do the kind of work, whether it will sell or not, that will satisfy your own soul. I am spending more time away from my business than I used to do because I am getting older, and I have other things. It happened that I was out in the woods and left alone for three days while my friend and the guides went down the river. I was thinking over and writing the headings of this talk—thinking it over link by link—and when I came to this, "Did you ever take time to do the thing you prefer to do, make the picture you want to make?" I replied, "Yes, I do, or why should I presume to talk to other people about doing it?" But the joke was this: I have got a kiddie, the dearest thing that lives to me, and I have not been taking the time off that I should have given to her. If you have got kiddies, give them half-an-hour a day. See them, learn to know them, and get the honey there is out of life! (Applause.)

Take the time to do those things you prefer to do, to read what you prefer to read. The majority of photographers, unfortunately, have not read—and are always apologising for the fact that they have not had time to read the things they ought to read; and I want to call your attention to the fact that we, inasmuch as we handle all types of men, have at times to handle people who have read, and you cannot expect to get from those people what you ought to get unless you are their peer in culture—unless you know the kind of things that they are accustomed to think. You cannot divide such a man from his own class and particularise him, you cannot know him unless you have read the kind of stuff he is accustomed to read. There have been people who have been born with more of the silver spoon than we have, whose start in life was on a plane above ours, and who, accordingly, have gone farther; and it is our job to be up there with them, so that we can meet them eye to eye and weigh them. If we are not able to weigh them and put them where they belong, how are we going to justify taking the money for the portraits we *allege* we are making of them? I was talking to half a dozen photographers here the other day, and I asked them if by chance they had read what to me is the most wonderful piece of compilation and reduction that has been written during this century—H. G. Wells's *Outline of History*—and I found that not one had read it. I was sorry, because it is a book worth reading. It is a book worth reading, because it will put you on a footing so that there will be understanding, and when other people talk about things you will not have to mumble and pretend you understand it. I wonder how many of you have read Barrie's *Courage*, the address delivered at St. Andrew's, on May 22. Few, I presume. But it is a gem that is rare, and other people are going to know about it. In any event, if you have not read it you cannot engage them on that subject, and it is a little thing that is so well worth reading that if by chance another man has read it, and you

Photograph by W. B. Chaplin (Russell & Sons), Windsor.

MEMBERS OF THE CONGRESS OF THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION, HELD SEPTEMBER 11 TO 16.

PHOTOGRAPH TAKEN ON SEPTEMBER 14 ON THE EAST TERRACE, WINDSOR CASTLE, BY SPECIAL PERMISSION OF H.M. THE KING.

A Key and List of Names identifying the members in this group are in preparation, and will appear in next week's "British Journal."

have read it also, you will be able to get the fire in his eye. How many of you have read that nasty book, Upton Sinclair's *Main Street*? It is sordid as any book ever was, but it is a book that everybody in England should read, because it has its parallel in England to the sordidness which it describes in America. It is not the America you would meet if you went there, but it is worth reading.

Of course, this is not a matter of reading some specific things: it is a question of keeping yourselves intellectually alive and abreast of events and of the thoughts of men. If we are to stand as we should before our clients and meet them on the level; because you cannot make pictures from far underneath, and have them without distortion—you have got to put yourselves up, and the only plea I am making to-night is that you do not let yourselves slip back into that life the ideals of which are merely competition with your neighbour in the matter of showing that you have got money. Compete with yourself. Give your family a chance. Let them know that the next generation has got to be a family that meets higher people than you can possibly meet by right of intellect. I am not speaking of birth or fortune. The true British democracy is of the mind and of the heart. After all, what I have said is only a plea for absolutely genuine moral earnestness. You cannot reach the goal all at once, but you can go a bit of the way if you only desire it hard enough. Your destiny is the child of your desire, but bear in mind that the father of destiny is always the will. If you don't desire it hard enough to go and do it then desire is merely a picture and a fiction.

Over in New York they are building a cathedral—a presumptuous thing to do in New York. But they are building a cathedral that some day, with the mellowness of time, and through the richness of human offering, will be a great temple. The story is told of a man who went up and saw the masons at work, and he said to one of them, "What are you doing?" The reply was, "I am cutting stone and getting ten dollars a day for it." He went to another man, "What are you doing?" "I am cutting stone for ten dollars a day, and only eight hours' work." And he went to a third man. "Well, friend, what are you doing?" "Me?" was the reply. "*I am building a cathedral.*" (Applause.) I feel that it is worth while to build cathedrals. When it comes to a new way of turning sixpence into half-a-crown, there are people who are much better able to tell you about it than I am. I have been fortunate enough, in spite of myself, to accumulate some money. I have been at it, it is true, nearly forty years, from the day I worked my fingers to the bone cleaning my floors and thus saving the price of a charwoman, which was two "bob" a day. I have got a little 3B Dallmeyer lens in the safe at home. It cost 84 dollars, and I bought it thirty years ago or more. That money came through doing that charwoman's work before I opened my shop in the morning; it was my own shop, I was on my own. While I had been working for other people I had been accustomed to smoke a twopenny ha'penny cigar after supper. I cut that out because I wanted the lens. I wanted the lens because I believed it was going to help me better to interpret. To me to-day that lens is a sacred symbol. It meant sacrifice. But this kind of thing does not end merely in sacrifice. It carries one along a road which has in it much elation. All through my life, whether people bought them or not, I have made in the set of the proofs a something that was the best I knew how to make, and you would be surprised to know how many of those better things people did buy. (Applause.) I was surprised, too. I said to myself, "These are things that are going to be bizarre to the people to whom I am selling pictures. Even if the man himself likes them, his wife will not." But the world is tremendously good. It does appreciate us much more than we imagine that it will.

So I kept on crowding myself all the time, and never leaving for an instant the idea that the man behind his face was the man I had to learn to know; the man behind his face was the man I had to be able to invite to the outside so that I might put him down, that his friends and his family might have him when the evil day came. One of the keen satisfactions I have is to know that all through the war, when our youngsters came to New York, they received wires from their homes in distant parts of the States, "Go to Pirie Macdonald before you leave." And they did come to me. I had then sufficiently devoted myself to the idea of getting that which was behind a man's face that these poor youngsters, some of them sick and nervous, some of them rigid with determination to do that which they knew in their souls they were affrighted to do, were read by me, and I was able to unfold better those kiddies than if I had not so worked. I felt that all my previous labour was paid for when I was able to do that. That was one of the few things in my life which really did pay. Widows and mothers have since come in in black, and I have never found it necessary to put my elbow before my eyes. I have gone out to meet them, knowing that I did all that I knew how to do that day. (Applause.) I might have done it better the day before or the day after, or another man might have done it better. But, friends, I want to leave with you only this. There is a job for you to do. British photography, American photography equally need an elevation. It is not a question of a trade council which was going arbitrarily to bind a man that he must not sell under three guineas a dozen. No; the elevation is to come from within yourselves. I want to leave with you the idea that you are to do each day—every day—the best that you know how to do that day. Thank you. (Loud applause.)

The chairman said that it was his business to finish Mr. Macdonald's lecture. Mr. Macdonald had shown them only one side of his life. He was known to them as a great genius, but he was also a great friend. Last year he (the speaker) made the confession to Mr. Macdonald that he was not doing the work he wanted to do, that there was something in it which was mechanical. And this great man, while on holiday, with little time to spare, devoted three and a half hours to the instruction of a brother photographer. He did not just talk; he actually took off his coat. During that three and a half hours he taught him what he had never learned before. When Mr. Macdonald came over this year he exacted a promise from him (Mr. Speaght). It was that once a month he should make a picture which did not mean bread and butter to him, that this should represent the very best that he could do; and then, by the time of the next exhibition, he would have eleven or twelve pictures made at his leisure, of which he could be really proud.

Mr. Swan Watson, in proposing a vote of thanks to the lecturer, said that while he could not agree with some of the things (not relating to photography) which Mr. Macdonald had said, he had felt the lecture to be most inspiring. He had touched upon the innermost things in their hearts. He had reminded him of Huxley, who wrote in his notebook on his child's birthday, "I will do the best scientific work from this day, no matter whether I may be recognised or not." Mr. Macdonald had touched on the question of the photographer's education. He believed that the future photographer must be a better educated man. Possibly in the future a photographer would send his son (intended for the same profession) to a university to study psychology, fine art, method, chemistry, and optics. Even those of them who were past the age at which they could expect to enter for a university degree could keep their minds active and add every day to their deeper knowledge. He had himself attended this year a class in optics and chemistry, taught by a man much younger than himself, and he had never had a more enjoyable time.

Miss Brownlee, of Bristol, seconded the vote of thanks in a graceful little speech. None of them could have listened to Mr. Macdonald, she said, without being moved, and they would all go out, not only better photographers, but better men and women for what they had heard that evening.

The vote of thanks was enthusiastically accorded, and, in reply, Mr. Macdonald said that this vote of thanks was in a line with the kindness he had always received in Britain. He believed that they were beginning an era of glorious years—glorious in the degree in which they made them glorious.

A PHOTOGRAPHER AND HIS ASSISTANTS.

Mr. C. P. Crowther's lecture, "The Man Behind the Camera," to the Congress on Tuesday in last week resolved itself into an amusing interchange of argument and badinage between himself, the Chairman (Mr. Marcus Adams), and members of the audience on the ethics of the use of the master's name on productions which were mainly the work of his assistants. Mr. Crowther began by exclaiming strongly for individualism, which meant, he said, the absolute overthrow of tradition. In his characterisation of various one-man photographers he made one or two members of the audience blush, and one (Mr. Herbert Lambert) even run away, at his rather thickly sugared compliments with regard to their individualistic work. Of Mr. Furley Lewis (who was present) he said that the lovely nature of the man came out in his work and in his life. He was a man for whom nobody in the world had an ill word, and he was the supreme example of a one-man photographer, who did everything himself, even to carrying the prints to the post. Mr. Crowther urged that photographers who exhibited should send to the exhibitions only their own individual

work. He sympathised with the plea that in business it was necessary to make the pictures which the client demanded, but for the sake of the photographer's own reputation or his own satisfaction with himself, when he sent to an exhibition he should send something which was his own production entirely, and which was done to gratify not his sitter but himself.

The discourse was interrupted here to admit of the lecturer taking breath, and Mr. R. N. Speaight availed himself of the opportunity to disagree with Mr. Crowther in certain respects. If a man was going to be a successful photographer he simply could not do the whole work himself. He was ready to admit that the ideal was a studio for one man who should do everything, but financially this was not practicable, at least not in London.

Mr. Crowther replied that he had been talking not business, but ethics. Had a man a right to sign a picture with his individual name when it was not entirely—perhaps not at all—his own work? This was one respect in which photography suffered in comparison with painting. The photographic result was brought about through the agency of perhaps four or five persons at different stages of the operation, whereas in painting the one man completed everything with his own hand. The ordinary studio photography, carried on in studios where several assistants were employed, he described as mill or factory photography, and everything was quite as it should be if only the name of the firm was "The —— Studios," but if it was the name of an individual which was placed on the prints, he thought that it had no more right to be there than to be on a cheque when there was not the money in the bank.

Mr. Speaight agreed that pictures from a studio, when exhibited, should bear the name of the operator, and that was the case with some of the pictures at present in the gallieries from his own studio. Mr. W. Illingworth was of opinion that whoever showed a picture for exhibition should personally print it, mount it, and deliver it. Miss Weston pointed out the fallacy of a comparison with the painter who, perhaps, got £150 for one picture, whereas the photographer got three guineas for a dozen. Mr. G. W. Futcher said that it was commonly supposed that a portrait done by Reynolds was three-fourths the work of his assistants. Mr. Marcus Adams said that he employed assistants, but he felt it his duty to lead them, and not to let them lead him. In many firms the assistants dominated the masters—not on the commercial side, but in the actual production of the work.

Mr. Crowther then resumed his lecture, and again declared against tradition. Tradition was a handicap. When the revolt came we should see quite a different world of light and colour. Tradition had no value. It was negative, retrospective, and retrogressive. The past was dead. Nothing could be achieved if we were manacled to yesterday. It was only by a refusal to accept tradition that we could hope to evolve new and better portraiture.

Mr. Herbert Lambert took exception to this. There were traditions in the past which should be studied, and the finest work now and in the future would be based on those traditions. One had to discriminate between traditions and what were mere passing fashions; but he believed that photographers had a great deal to learn from the old painters with regard to the tradition of lighting.

Mr. Furley Lewis, in reply to a call from the Chairman, said that as his name had been mentioned he would like to say that his only reason for being a one-man photographer was an entirely selfish one—he enjoyed every bit of his work.

Mr. Swan Watson uttered a genial protest against the forcefulness of language which some speakers had used on that occasion in putting forward their views, imitating, apparently, a speech by a distinguished visitor the previous evening. He was old-fashioned enough to believe that in connection with photography there never arose any occasion when such expletives were necessary; they should be reserved for much more important occasions. With regard to the bone of contention which had been cast into their midst, he reminded the Congress that both Michael Angelo and Raphael employed many assistants, and their masterpieces were largely the work of such assistants, although they were universally credited to the masters.

Mr. Crowther having apologised on behalf of some speakers, and also possibly on his own behalf, for having let slip some forcible and picturesque expressions, which, he said, were uttered with no thought of anger, but only for decorative purposes,

Mr. Adams closed the discussion, remarking that it had been a most interesting afternoon. He still disagreed with Mr. Crowther. If he designed a building it did not mean that he was going to lay the bricks, and yet surely the credit of that building should go to himself.

ASSISTANTS' EVENING.

On Thursday evening the assistants gathered at Prince's Gallery by special invitation. The invitation was accepted in surprising numbers, and a thoroughly enjoyable evening resulted. Much of the success was due to the fatherly manner of the President, who won instant popularity among all the young people, especially the young ladies. The various members of the Council were also well in evidence in seeing that the guests gave adequate attention to the good things in the exhibition, and also that they were replenished in the inner man—or woman. There was very little that was formal about the proceedings, and after a brief lecture or two the company broke up into groups and were taken round among the portraits by various members of the Council. Subsequently they met again in the Congress gallery, when a flashlight photograph was taken, and the result of the window and showcase dressing competition was announced. The judges gave ten marks for selling value, five for general attractiveness, and five for genius and novelty in arrangement. The first prize of two guineas went to Mrs. Tucker (employed by Angus Basil), the second prize of one guinea to Miss Kirby (employed by Gordon Chase), and an extra prize of one guinea for a showcase to Mr. Bates (employed by F. G. Wakefield). The successful prize-winners received their awards amid loud applause, and with some excellent remarks from the President on the value of the guinea.

Subsequently Mr. Bamber, of Blackpool, offered a prize of ten guineas for the best account of the assistants' evening, and Mr. W. Illingworth, of Northampton, immediately offered a second and a third prize, respectively, of two guineas and one guinea, for such essays.

The customary vote of thanks, moved by an assistant in the body of the hall, had added to it a recommendation that the assistants' evening be an annual function, and this was adopted, amid loud applause.

Assistants as Associate Members.

Mr. George Hana, a member of the Council, addressed those present on this subject. He said that he wanted all the assistants to come into the Association. He believed the Association would be strengthened by an associate membership of assistant photographers. He spoke only for himself, not for the Council, nor for the Association. For his own part he wanted them all in. It would be for the benefit alike of the Association and of the assistants. The Association had been twenty-one years in existence as a masters' association. It had done good work, alike for the individual and for the whole profession. The evidence of that was on the walls of the Exhibition. He could safely say that such an Exhibition would have been impossible twenty-one years ago. How far it might have fallen short had not the influence of the Association been there to help it forward he was not prepared to say, but he had not the slightest doubt that the Association and its counterparts in other countries had had a broadening and enlightening influence on the general body of photographers which made for better work. He believed that never before in any country had a better photographic show been exhibited. He wanted to see them all members in some form or other. Those of them who had ambition would find it stimulated and given more opportunity within the Association.

The Association, although a masters' association, had not ignored the existence of the assistant. Many years ago it formulated a scheme for giving the assistant a status; unfortunately that scheme was years before its time. At the present moment the "Record"—the very latest expression of the Association's activities—had a plan for bringing together employer and employee, which it was quite possible in the future might be of very great usefulness. He saw no point at issue between these two bodies of masters and assistants. Both bodies could be members of the Association with equal advantage. The Association had no limits or restrictions to its energy. Its whole aim and object was the betterment of photography generally. He could conceive no line in pursuing that object which would be adverse to the assistants. He would like to see them all members, and that was all he had to say; he had no cut and dried scheme, but it would help the Council to have some opinion from the meeting.

In reply to a member of the audience, who suggested that the

Council should seriously consider the question and formulate a rough scheme and then call together a sub-committee of assistants, and afterwards another meeting of assistants to lay the whole scheme before them, Mr. Hana said that the Council had it already within its discretion to do this, but it was desirable to get more definitely the feeling of the present meeting than such a suggestion conveyed.

Asked to define "Associate," he said that under the articles of association there was a clause defining associate membership, and any proposals would have to conform to that clause. The annual fees and other details would be determined by the Council. The Association already had powers to take in associate members. The scope was very wide, and the articles had been framed with a view to bringing in everybody whose influence could be of value in furthering photography generally, though he thought they would stop short of bringing in the amateur.

An assistant expressed the view that the time was not yet ripe. He was pleased that some member of the Council was considering the assistant's side of the question, but the obstacle was a want of confidence, which started right down in the workshop. He himself had spent many years as an assistant, and had worked for a number of employers, and he had found generally that there was not that confidence between employers and staff which one would like to see and which would serve as a basis for working together in an association. The position of the employee was always that he wanted more money and shorter hours, but photographic employers—perhaps it was not peculiar to them, but they were the only ones of whom he had had experience—did not study the matter from the scientific point of view It had been proved that if matters were suitably arranged in the workshop there could be a higher output and efficiency consistently with shorter hours and no "drive" at all. The lessons of industrial efficiency were very little studied in the photographic profession. The speaker also complained of an unwillingness on the part of the employer to give the assistant prints which were his own work and which he could use as specimens.

Another assistant (a lady) said that the previous speaker's remarks only proved the necessity for discussing these things in common.

Another lady assistant said that the Association had been in existence for 21 years, and this was the first time that assistants were allowed to gather together. They were such utter strangers and so shy that it was scarcely possible to expect any full expression of opinion.

Mr. Hana said that the gentleman who had spoken had put his finger on a sore spot. But he thought that the rights and wrongs of the matter became more evident as the years went on. Twenty-one years ago before the Association was formed this complaint might have been made much more forcibly than to-day. Employers were more human to-day than they were then. The majority of them were beginning to recognise the true aspects of this question. If the Association should remain silent and offer no inducements to assistants, that, to his mind, would be a dereliction of duty. Lack of confidence was a very difficult matter to tackle, but he believed that it would gradually disappear. Surely there was no other work where people earned a living in which the spirit of comradeship was more necessary than in photography. Whose fault was the lack of confidence? Was it entirely the fault of one side, and not at all of the other? Might it not be partly the fault of both sides? A lady had said that they were strangers. If they had been strangers must they always be?

The President said that the feeling of the meeting appeared to be that the Council should formulate some scheme and ask the assistants to discuss it. He asked those who felt that the time had come to explore the possibilities of closer union to hold up the hand. (Many hands were held up, and there were no dissentients.) The President went on to give a homely little talk on the value of hard work to make up for the absence of genius, repeating a remark of his father, after he (the son) had visited a phrenologist and had been told of certain temperamental defects. "Well, if you have to fight against that, it only means that you will have to do more than the average person." He added that in his own establishment he was blessed with a lot of fine assistants, who studied him in every way. Therefore what could he do but study them? (Applause.)

Exhibition Pictures.

Mr. Marcus Adams then gave a little talk on "Exhibition Pictures." It was one of his greatest pleasures, he said, to face that audience, because they were fellow-workers. On several occasions he had had the pleasure of addressing fellow master-men, but that did not equal the pleasure of addressing assistants. Here was the genius of the future. He remembered well thirty years ago printing the first proofs and cleaning the floor and windows and doing odd jobs in his father's place. He had done everything that was dirty in photography, and everything that was clean, and he was thankful to-day for that education. To-day they often heard of professional photographers who bubbled up and produced most wonderful results. That was illustrated in the Air Force during the war. But he understood even there that the man who had the foundational training was the man who did the best work all the time. He recalled some kindly advice given to him by the late Snowden Ward, who caught hold of his arm on one occasion and said, "Now, Mr. Adams, I am going to give you a drubbing." He did give him a drubbing, and he (the speaker) left him with a determination that he would do better, and that his pictures should be accepted instead of being refused at the exhibitions. The reason why he took up exhibition work was in order to do something he was not paid for doing—something in which he had liberty to please himself. During that training he found that it was too much for him as a master man to expect to do it all himself. Therefore he had to undertake the training of the people round about him in order to assist him to accomplish what he wanted. Eventually, he was delighted to say, the people who happened to work round about him realised what he wanted, and in full sympathy assisted him to get what was to be seen on those walls. He had little to do with the printing of those pictures, but those who assisted him felt with him all the time they were working on them. He was simply trying to persuade both masters and assistants to work in sympathy, and not one against the other. His principle was that everyone who came in contact with him had a soul, and was every bit as good as he was himself, only—fortunately or unfortunately, probably fortunately for themselves—they were not masters.

He had carefully studied every picture in the galleries, and he believed they were better for the assistant's help in the production of them. Two or three years ago an exhibition of this kind would have been impossible, but it had grown from the exhibition which was held three years ago, and he could assure them that before many years the Association would take Burlington House with its many galleries If the assistants would put their backs into things, photography could be raised to such a pitch that many painters would have to tremble in their shoes as to where the next crust of bread was coming from' What could they do to assist their "bosses"? When they produced better work the clientèle would be better satisfied, the firm would be able to charge more money, and the assistants would find themselves compensated with higher wages, and if they were not, they should write to the Secretary of the P.P.A. about it. If there was a master so mean that he could not appreciate the brains of those who worked for him, then he was not fit to be a master. But that was not the kind of firm that was going to elevate photography. Here the speaker quoted Pirie Macdonald's illustration from the building of New York cathedral which was given in his lecture the previous evening and reported there. That was the spirit, he said, for every assistant to emulate. They had to produce a picture which should be worthy not only of the firm but of the person it represented. The crux of the whole situation was sympathy, unity, the work of the team. A motto he had preached for years was that if every assistant made it easier for the next person who followed on in the work, the work would go out with less friction and more happiness, and if the work was not got through happily there would be no exhibition pictures.

SHORT DISCUSSIONS.

On Wednesday afternoon a number of brief discussions took place, and the interest was well maintained throughout. Mr. Alexander Corbett took the Chair.

Should Brother Photographers be at Daggers Drawn?

Mr. Herbert Lambert opened a discussion on this question. In theory everyone would agree that brother photographers should not be at enmity, but in practice, although the drawn dagger might not often be seen, there was a tendency for the hand to be on the hilt, or at least for a little unnecessary coldness or suspicion to be in evidence. This applied more to provincial towns than to London. The attitude of "daggers drawn" was singularly difficult to maintain. He would not say that he had never tried to assume

it, but certainly he had never succeeded in keeping it up for very long. The humour of the situation would not allow of it. Human beings had not the semblance of lions, who might perhaps pass off such a situation with dignity. They were evidently meant to be comrades. It was not to the advantage, again, either of the individual photographer or of the profession as a whole that there should be any coldness or the exclusive individualism sometimes to be seen amongst those practising the same profession. What would happen in the medical profession if such an attitude were maintained there. The great thing to be considered was the improvement of the profession as a whole. A man might say that his rival had to be treated carefully, because the more the rival did the less there was for himself to do. There could be no more lying half-truth than that. The profession of photography, in this country especially, was not half nor a quarter developed.

In talking with some of the delegates from overseas he had learned that in America the custom of having a photograph taken was much more common than it was here in England, where thousands of people went through life without ever facing the camera at all. And the reason for this apathy on the part of the public was that a great deal of the work which was done was not really interesting. There was a formality about it, and a lack of life. If they could put more vitality into their work, more sympathy with the subject, and less suggestion of routine treatment, the general interest in portraiture would be very much increased, and a larger number of people would go in for photographs. Mr. Frank Brown had questioned on the previous day whether the kind of work sent to exhibitions was suitable for sending to clients. Most certainly it was. The selection committees or judges looked at the matter from a very similar standpoint to that of the public. In looking round the exhibition he could see scarcely a single picture which would not be an attractive thing for the sitter to possess.

If the general level of the work was raised there would be more work for photographers as a whole. Therefore, there was no need to keep secret any little process. The man who went about feeling that he must keep his processes to himself was likely to end up by being the only one who thought his results wonderful at all. He related an amusing story of how he had visited a photographer in a little town who, after being suspicious of him at first, afterwards said with a great air of mystery that he had got a new thing which was just wonderful. When the secret came at last to be revealed it proved to be the Eastman portrait film! Photography, after all, was such an interesting job that he did not see how any man who made a lifework of it could keep it to himself. The work was full of absorbing interest, though, of course, it might appear less interesting to the man outside, like the piano-tuner in "Punch" who turned round to an artist and said, "It must be a terribly monotonous job, painting pictures." The greater the amount of co-operation between brother photographers the better.

Mr. George Hana heartily agreed with Mr. Lambert. In the old wet-plate days photographers were rather in the habit of working individually and in secret, but now they met in the open and criticised and emulated one another. The broader outlook was evident on every hand.

Mr. Walter Stoneman took up Mr. Lambert's remark that it was the big men who were only too willing to be open and frank, and to encourage the others to talk with them. But surely that was because the big men were in such a position that they could afford it. Such men were six feet above contradiction. The man who was struggling—who found photography not only an art he enjoyed, but a method by which he earned his daily bread—did not find it so easy to talk over a matter with a competitor. There was only a certain amount of work to be done in a certain town, and it had to be shared by three of four photographers. How were these three or four to talk matters over?

Mr. Lambert said that it was a fallacy that there was only a certain amount of work to be done. People could spend their money on photographs or on something else, and if they were attracted to spend the money on photographs they would do so. The general level of American photography was more adventurous and more vital than here. If the work was made more interesting there would be more people running after it.

Mr. F. Read said that for many years there had been an undercurrent of hostility in some towns, but surely the strength of the Association ought to minimise that feeling. In Lancashire, the visit of the worthy President and Secretary this year, and previously of Mr. Lang Sims had done a great deal of good, and if only more members of the Council would meet the photographers in the various provincial towns it would act as a great unifying influence. In his trips to Canada he had been struck by the feeling of brotherhood in the eastern part of the Dominion among men following one particular calling, i.e., commercial travellers.

Mr. G. A. Futcher mentioned a case in which a photographer was making some experiments with shop-window lighting, which had to be done by artificial light, and was accosted by a rival photographer, who, meeting him afterwards in a dealer's shop, asked him about his stop and exposure. He told him the technical data, but he wondered what would be the proper course to take under such circumstances.

Mr. Lambert said that, of course, a rival might take advantage of such information, but, in general, he though the rivalry could be kept on a sporting level, which was perfectly compatible with friendship.

Mr. N. S. Kay said that he did not mind rivalry, but when a rival obtained knowledge which it had taken the other years of experience to accumulate, and immediately went and did the same thing and cut the price, it was not fair.

Mr. Drinkwater Butt said that there were two sorts of competition. The man who competed fairly was quite a good friend, since he stimulated one to do better work, but the man who competed unfairly must be treated with contempt.

Mr. Lambert agreed that if in this "sport" there was cheating it must be treated as cheating would be treated in ordinary games. But in fair sport one could enjoy one's opponent's fine strokes.

Photographic Parasites.

Mr. Frank Brown, in opening a discussion on this subject, said that "parasites" was an unpleasant term, but the thing itself was unpleasant. He was not alluding to small competitors who opened a little hut in a back garden and were something of a thorn in the side of the well-established business; nor was it the travelling photographer who made a pitiful yarn, and—especially when, as had happened three times in his experience, the person was a woman—intrigued himself or herself into one's sympathies. There was a class of individual who settled in a certain street, called himself by the same name as a reputable photographer of the neighbourhood, and went round the other side of the town soliciting orders for enlargements and collecting half-crowns on account, representing himself as from "Mr. Brown, of London Road." The people, knowing the good reputation of "Mr. Brown, of London Road," parted with their half-crowns and their pictures, presently to be disillusioned. More than once he had been tackled because his "representative"—of whom he had no knowledge whatever—had acted in this manner. These people commonly rented a room in the same neighbourhood as a reputable firm, and traded upon the firm's name. It caused much annoyance and some injury to one's local reputation. What remedy could anyone suggest?

In reply to a member, who mentioned a notorious case of the kind, Mr. Brown added that the Council had had complaints before it on several occasions, but the difficulty was that people who had been victimised had not the courage to come forward. If the Council could be supplied with full facts and particulars, proper advice would be taken.

Mr. J. M. Chew described a mushroom business in which three men had been victimised to the extent of each paying £150 for what proved to be quite a worthless concern, in which people had been defrauded over enlargements. The same speaker stated that he was commissioned to photograph the King's guard during his Majesty's visit to Aldershot, and while preparing to take the photograph he found another photographer present. Before the preparations had finished the guard dispersed, and on approaching the commanding officer he found that that officer had been under the impression that the other photographer was the authorised individual. However, the guard was reassembled and the proper photograph taken, but next morning the man who had "chipped in" submitted proofs before he could do so, and endeavoured to undercut him.

Mr. W. Coles said that the remedy was for local photographers to associate a little, sufficiently at all events to educate and warn the public in the matter.

Mr. Marcus Adams thought it would be a good subject for the daily Press to take up, inasmuch as it could be dealt with much more effectively from outside the profession than from inside.

Trade Enlargements.

Mr. F. G. Wakefield brought forward a grievance against firms describing themselves as trade enlargers who were "taking the bread out of one's mouth" by broadcasting trade price lists to business firms all over the country, with the result that the publicity departments of those firms knew exactly what these enlargements cost. He himself did a great deal of commercial work, particularly in photographing motor cars, but of late years he had done very few enlargements for the firms in question, and he found that they were being done by trade houses much more cheaply than he could do them. When he put forward a claim for a guinea, he was answered that the work could be done by one of these firms for 8s. 9d. If he refused to lend the negatives, his clients were likely to reply by closing the account. The ethics of the matter seemed plain enough. He had done his difficult work by getting the negative, and surely he was entitled to his profit on the enlargements. He would advise others not to lend their negatives if they could help it. The negatives should be regarded as the property of the photographer in the absence of an express stipulation to the contrary.

Mr. Drinkwater Butt pointed out that certain of these firms were working for the amateur at exactly the same price as for the professional.

Mr. A. W. Wakeling said that in every case he had an understanding as to whether the negative was to be his property; if the firm desired the negative, he made a special charge.

Mr. C. P. Crowther expressed admiration for the firmness with which Mr. Wakefield had stood to his guns.

Mr. W. Coles said that it was quite clear that they could not expect any sort of protection unless it was of a kind which could be legally claimed. The charge for any professional skill should be made in the execution of the original order. Everything that was complained of in these cases was quite open and above board. The advertisements were broadcast. It was rather absurd for the photographer to think that because he made a good negative he ought to get a fancy price for the enlargements. If people wanted the negative they must be charged accordingly. There was not much personality going into a technical enlargement.

Mr. Wakefield pointed out that clients approached one months afterwards with regard to the enlargements, when the charge for the negative could not be altered. It was a point of complaint that the firms of trade enlargers made the same charge to those in the profession as they did when working for the big firms—like Selfridge's, for instance—direct. He hoped that his remarks would draw attention to the grievance.

VISIT TO NATIONAL GALLERY AND NATIONAL PORTRAIT GALLERY.

On Tuesday morning a large number of members of the Congress met at the National Gallery, where special lectures were delivered by Mr. R. Gleddowe, Assistant Director, and Mr. Hubert Wellington, Official Lecturer, on "The Composition and Lighting of Pictures." One party started with Italian portraiture and worked round to Northern (Flemish) portraiture; the other began with the Northern work and worked round to the Italian.

Mr. Gleddowe began with some remarks on the pictures of Jan Van Eyck. He said that these pictures illustrated the fact that the absolute essential of portraiture was truth, and that quite subsidiary to truth were selection, design, and arrangement of lighting. The portraitist was producing a document which people would consult, not merely a work of art which they might enjoy. No painter had ever shown more zeal for truth than Jan Van Eyck. This Flemish painter employed two methods of portraiture which were exemplified in portraits in the gallery almost side by side. By one method he concentrated the whole attention on the features, and by the other he gave to surrounding objects and the background an equal importance. Photography, of course, was quite capable of making the surroundings of the same importance as the face, and perhaps more might be made of portraits which betrayed by means of typical objects used by the subjects the nature of their calling or their favourite pursuit. If, however, these objects were given equal definition with the portrait, as Van Eyck gave them in certain examples, it would not find favour. People would ask what was the use of giving a telephone a value and emphasis equal to that which was given to the face. Van Eyck, however, did this, and, after all, in Nature everything, whether features or inanimate objects, might be equally lighted up. He wished that someone would try to recover the value of the setting of the photograph, instead of leaving it as at present out of focus and carelessly arranged. He passed on to the work of Bouts, a contemporary of Van Eyck, to show how he got that quality into his paintings which was now called "atmosphere"—a quality which seemed to set the objects in a kind of rarefied air suitable to the subject itself. He thought that these early Flemings would gladly have employed photography had it been available; they would have used it as the basis for their painting. They would have produced a light print to give them the exact contours and forms on which their painting could be based.

Coming to the Rembrandt portraits, he remarked upon the presentment of character shown in the "Portrait of an Old Lady." Rembrandt was interested in the surface quality of his painting, but also in the character of his sitters. His treatment of the hands was always notable. Hands were quite frequently introduced in the portraits at the Royal Academy, but in many of such portraits they might be anybody's hands. If hands were worth putting in they were worth properly studying. The portrait of "The Borgomaster" by Rembrandt was a new thing in northern portraiture in that it suggested, not the permanent expression of the sitter's character, but a fleeting expression. Photography, of course, had an advantage over painting in this respect. Some of the works of Velasquez were noted in passing, and then Holbein, whose "Christina of Denmark" was strictly in the Van Eyck tradition. In this work Holbein had reduced the lighting interest to the absolute minimum. The light was direct upon the face, which meant that there was no modelling in the head at all except the slight relief of the nose. To give the subject the amount of character he did with that minimum help of lighting was an astonishing technical achievement.

Next he came to Gainsborough, reminding his hearers that Gainsborough painted portraits of English gentility, not for the purposes of real portraiture, but to furnish pleasing and decorative pieces for the interiors of rich houses. The portraits of the Baillie family were instances of shimmering surface and general charm, without the smallest psychological interest. Gainsborough, however, was quite capable of portraying character if he wanted it, and he instanced his portrait of Blackstone, and of his own daughters—the latter showing figures in quite violent motion. Some of Reynolds's work was pointed out, especially the heroic figure of Lord Heathfield, which was Reynolds at his best. He contrasted Reynolds with Hogarth, the former a man who believed in the aristocracy, and gave a heroic stature to certain figures, the latter a satirist, who believed that one man was as good as another. The picture of Hogarth's servants was full of first-rate character. Van Dyck's equestrian portrait of Charles I., Raeburn's works, giving singular delight to the eye for the quality of their paint, Sargent's "Lord Ribblesdale," and Millais's "Gladstone"—the last named remarkable for the eyes and mouth—were also looked at, and the tour finished in the Italian room, where the lecturer pointed out some of the glories of Titian, particularly his portrait of Ariosto, which for some reason had managed to arrest one generation after another.

The party then adjourned to the National Portrait Gallery, where the President (Mr. Swan Watson) pointed out various portraits in illustration and amplification of the remarks in his Presidential Address the previous evening. Among the points he mentioned were the desirability of getting the low point of view—i.e., keeping the camera low—in the case of people with small chins; the value of a shadow on the hand particularly if the hand was dropped over a chair, when, in the absence of such shadow, it was likely to suggest paralysis or rheumatism; the rarity of the smile in paintings of children by great artists, and here he found even in photography that if there was a repeat order for child portraits it was the serious and not the smiling portrait which was favoured; how Romney managed the delicate art of giving a faithful likeness and flattering at the same time; the fact that it was irregularity of feature which gave character; how in the case of ladies who let their hair fall over one side of their forehead and not over the other it was well to have towards the light the side over which the hair hung; and the truth of the old rule that a portrait should have either one strong light or three lights, one principal and two subsidiary. This last was illustrated by reference to Sargent's "Henry James," where there were but two lights, one on the

head, and the other on the hand, and where a third light seemed to be wanted. With regard to the many portraits in the Gallery into which some instruments or other objects to suggest occupation were introduced, the President's experience was that the modern man did not want to be associated with any accompaniments relating to his profession, and some even objected to a book because they thought it might look as though they pretended to learning.

These were only a few of the interesting points in a very educative tour, after which the members adjourned to Gatti's Restaurant and lunched together.

VISIT TO A HALF-TONE AND COLOUR REPRODUCTION DEPARTMENT.

On Wednesday morning members of the Congress visited the studios of Madame Yevonde, Messrs. Arthur Banfield, Angus Basil, Alexander Corbett, Reginald Haines, Layfayette, Ltd., the Hana Studios, Ltd., and J. Russell & Sons, Ltd. About fifty members, under the leadership of Mr. Lang Sims, accepted the invitation of General W. F. Mildren, C.B., to visit the half-tone and colour departments of the printing works of the Amalgamated Press, in Southwark. Here, in the course of two hours, the complicated processes necessary in the production of illustrated periodicals were explained and demonstrated. The guide on this tour was the head of the departments, Mr. R. Vincent. After the work in the old premises in Lavington Street had been inspected, the company was taken over to the large new building on the other side of Southwark Street, which the Amalgamated Press is to occupy in the course of a few weeks. This is a building whose exterior gives the impression of a smaller Crystal Palace, for the amount of glass used in the walling is remarkable. On the top storey of this new building there are to be five immense cameras, each consisting of a single dark-room, and fitted with 60-inch lenses.

On the roof of the building, from which a wonderful and unaccustomed view of the City of London is to be obtained, Mr. Vincent initiated those present into the secrets of pictorial reproduction on a colossal scale. He said that the department was responsible for the reproduction of the illustrations in some 85 papers. On an average, one complete block was turned out every three-quarters of a minute all through the day, and one complete weekly paper (counting monthly magazines as four weekly papers) was turned out, so far as his department was concerned, every three-quarters of an hour. It was necessary to be one, two, or three weeks ahead of publication, according to whether the periodical was of a topical or a non-topical character. The circulation of the eighty-five papers was some 11 million copies. Mr. Vincent went on to describe—what was already familiar to some of the audience—how line illustrations are photographed without a screen, while for the half-tone a screen is employed, the purpose of which is to break up the continuous tone of the negative so that the printing can be done down on to the metal in an acid-resisting substance. The variously ruled screens were exhibited, ranging from one of 64 lines to the inch for coarse newspaper reproduction, to one of 150 lines to the inch, or even finer. He stated that only three firms were making such screens—namely, Levy of Philadelphia, Brown of Leicester, and a German house. Two 20 x 30 screens used in the department cost £105 each. In the case of three-colour work, it was necessary to use a special angle so as to form a star pattern of dot, and if the lines were at any other angle the result would be a failure. The process plate was used for colour work, and it was simply a question of photographing through the three filters. The conventional filters were red, green, and blue, but there was no recognised standard for them, and every process man would declare that his alone was correct. The yellow, blue, and red printing negatives were printed down on to the copper plate. For very fine art work a grey block was also used, taken through a K 1 or K 2 filter, so as to give the general tonal value of the coloured original, but this was only for the reproduction of Academy pictures or similar work, and for ordinary work, such as magazine covers, the three colours sufficed. He pointed out the absolute necessity for a perfect reproduction of the negative as an acid-resisting print. Up to this point the process was purely and simply photographic, but after this, it left the photographic side of the business entirely, and became a different trade. The blocks went over to the etching department, where the etcher by one method or another would get away the unwanted metal. He emphasised the specialised skill necessary in the different operations, and added that lads were apprenticed for the different parts of the work, usually for five years. One interesting remark was that the late Lord Northcliffe for some time entertained the idea, of which it was very difficult to disabuse his mind, that the "Daily Mirror" could be produced in colour. It was necessary to marshal the technical objections in a very exhaustive treatise before he was convinced of the impossibility.

To the casual observer with a philosophic mind the wonder was to see so many men engaged with intense application at rows of desks improving colour work stage by stage, as careful of every little detail as though there depended on it whether a king was made to frown or to smile, and in the result nothing but a further instalment of the adventures of the "Bruin Boys" or "Tiger Tim"!

Before leaving the building, the visitors, on the proposition of Mr. Lang Sims, passed a hearty vote of thanks to the Amalgamated Press and the departmental director for a morning of instruction and entertainment. Mr. Vincent briefly expressed his pleasure in having acted as guide.

War Grave Photographs.—Relatives of British soldiers buried in French war cemeteries have been informed by the Imperial War Graves Commission, 82, Baker Street, W.1, that photographs of graves are no longer being taken by the War Office, and that the Graves Commission does not take such photographs itself.

The British Industries' Fair.—The Fair for 1923 will again be held at the White City from February 19 to March 2. Forms of application for space have just been sent out, and should be filled up and sent in by October 7 at latest. The Board of Trade announce that they have been able to reduce the charge for space by 6d. per square foot, and accordingly it will now be 3s. The cost of the stands erected by the Department for exhibitors will also show a very considerable reduction, so that the total cost of showing at the Fair will be appreciably lower than in recent years. All particulars may be had from the Secretary, British Industries' Fair, 35, Old Queen Street, S.W.1.

Polytechnic School of Photography.—The 1922-23 session of the school of photography at the Regent Street Polytechnic, opens on Monday next, September 25. The school, under the direction of Mr. A. J. Lyddon, provides day and evening courses of training in studio portraiture by day and artificial light, negative making and printing, retouching and colouring, enlarging, commercial photography, in addition to half-tone block making. The classes are conducted by Mr. Edgar Clifton, Mr. L. J. Hibbert, Mr. H. G. Harrison, Mr. H. C. Standish, Miss N. Hill, and Mr. Lyddon, the last-named of whom will be glad to advise intending students on the courses which they may take up. As we know, students receive a thorough and practical training, and one which is of great advantage to them in earning their living by photography.

Einstein's Theory Tested by Photography.—Photographic proofs of Einstein's theory that space is curved, and starlight bent out of the straight line, obtained at the time of the eclipse of the sun in May, 1919, were due entirely to English astronomers, says the "Daily Chronicle." These made their preparations hurriedly on the sudden termination of the war providing the opportunity to make the necessary journeys to Brazil and West Africa. Because of this, the photographs were not generally accepted as conclusive. On Thursday of this week (September 21) another opportunity was afforded by a total eclipse of the sun visible from the Indian Ocean and Australia, and many parties of astronomers—English, Australian, American, Dutch, and German—made elaborate preparations to photograph the stars near the sun at the moment it was totally eclipsed by the moon. It is to be hoped that sufficient photographs have been obtained to settle once for all the question of the deflection of light, which is a necessary corollary of Einstein's relativity theory of gravitation.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, SEPTEMBER 25.

Southampton C.C. Judging the President's Competition.
South Glasgow C.C. Outing to Callander
Wallasey Amateur Phot. Soc. Photography as a Hobby. A. H. Farrer.

TUESDAY, SEPTEMBER 26.

Bournemouth C.C. Competition. "Pictures without Words."
Hackney Phot. Soc. English Ecclesiastical Architecture. J. Cox.
Manchester Amateur Phot. Soc. Lecturettes (a) "The Treatment of the Sky in Lantern Slides"; (b) "Dark Room Devices." W. W. F. Pullen, H.M.I.

WEDNESDAY, SEPTEMBER 27.

Rochdale Amateur Phot. Soc. Exhibition of Members' Holiday Prints.

THURSDAY, SEPTEMBER 28.

Hammersmith Hampshire House Phot. Soc. "Durham." Robert Chalmers.

SATURDAY, SEPTEMBER 30.

Bradford Phot. Soc. Outing to Sunnydale.
City of London and Cripplegate Phot. Soc. Outing to Westminster.
Edinburgh Phot. Soc. Outing to Roslin and Polton.
Hackney Phot. Soc. Outing to Gerrard's Cross and Chalfont St. Peters.
Hammersmith Hampshire House Phot. Soc. Visit to the London Salon.
Wallasey Amateur Phot. Soc. Outing to Liverpool, Old Buildings and Docks.

CROYDON CAMERA CLUB.

Dr. D'Arcy Power, the editor of "Camera Craft," hailing from the other side of the herring pond, gave a most interesting evening on a method evolved by him for chemically toning bromide prints in two colours, and then employing them as a basis for the application of coloured pastels. Many, unfortunately, seldom seen faces turned up for the occasion, including distinguished visitors.

A number of prints illustrating the process were on the walls, some excellent indeed, others in general opinion (freely expressed after the lecturer had left) not quite so happy. Owing to circumstances beyond control no examples of portraiture were included, but all pointed to the fact that the method would be highly applicable to camera portraits, especially those in delicate key.

From the nature of the medium there is a tendency to block the shadows, with gain in effect in some cases, and undoubted loss in others. In the lighter tones the delicate bloom and atmosphere of pastel work is well preserved, and to some extent the photographic base disguised, though plainly evident to the trained eye. Essentially the process is a difficult one, and there is no muddling through, for in the preliminary treatment of the bromide print the desired effect has to be gauged in advance, by no means an easy task.

Briefly, a bromide enlargement is bleached locally, and then immersed in the sulphiding solution. Local gold toning follows, the black portions of the picture assuming a bluish tint, and the sepia parts warmer shades to bright red.

Although two colours only are produced, others are simulated in very puzzling fashion. This was strikingly evident in a two-toned print of an open forest glade in mellow evening light. Here the orange glow in the sky, and warm broken patches in the foreground, induced a complementary and appropriate green hue to the foliage. Only by covering the other parts could it be ascertained that the green was but a pleasing fiction of the brain.

To this two-toned photograph coloured pastels are applied in the usual way, by stump and flannel. A moderately rough (American) bromide paper is used containing the minimum of gelatine. The ordinary fixatives are unsuitable for locking the powder colours; steaming the print answers well.

So far, the cart has been placed in front of the horse, for Dr. D'Arcy Power started with many helpful references to line, tone, and colour in its psychological aspect, and he expressed a confident opinion that if photography is to realise itself fully, colour must come ultimately. No mere mechanical transference of Nature's colours to paper or glass, however, will suffice, and whatever method he evolved it must be one which will allow the intervention of the artist.

In Nature, by the juxtaposition of different colours mutual reinforcement occurs, and a mass of one colour will always excite a sensation of a complementary colour in regions adjacent. For this reason the shadows in foliage never appear green. Also a large area of predominant colour in Nature rivets the attention to the subordination of surrounding tints. Reproduce this ever so faithfully on, say, a small screen-plate and the main *motif* is lost, for no longer the predominant colour rivets the attention, owing to other colours, unnoticed in the original scene, becoming very apparent.

If one has to suggest colour contrast in monochrome, he said, in nearly every case a certain amount of falsification, or departure from real facts, is necessary, and usually the warmer colours are rendered the lighter. This applies not only to photographers, but equally to engravers. Frequently, he continued, the run of the tone values is detrimental to good composition, and in such cases it is often possible to compel the eye to follow a better colour line, with consequent improvement to the picture.

Remembering that artists not infrequently use a painted base of warm and cool hue to receive the pigments, the idea struck him that a two-toned bromide print would form a good base for the application of pastels, and so it proved. No artist, he said, will tolerate a black and white photograph coloured with transparent pigments, as the black tells through and degrades all colours. His system avoided this, and also preserved structure.

Mr. Salt opened the discussion by saying that if the lecturer had seen some really beautiful portraits in heavy vein, which were dependent upon the application of transparent pigments to a monochrome photograph, and recently shown in the Club, his opinion as to this procedure would undoubtedly be modified, if not reversed. No method of graphic expression equalled photography in its capacity to represent texture, and transparent colours, obviously, must retain this in greater degree than would be possible with pastel pigments of greater opacity.

Mr. G. E. Brown said he would express no opinions on matters of art, but felt compelled to express the pleasure he had experienced in listening to a most interesting address, in which the technics of the process had been admirably expounded. All present might not know that Dr. D'Arcy Power was one of the first to devise vertical enlargers, the forerunners of present-day very perfect appliances. Also, he had done much pioneer work with quartz lenses for portraiture.

Mr. Harpur (whose habit of looping the loop several times before landing on the subject, obviously astonished the lecturer) said unkind things about Bromoil, the relevancy being that the pastel pictures exhibited far better hand-introduced clouds. Mr. Hibbert pointed out that two-coloured pictures of sorts could be obtained by the local application of salt solution to self-toning papers. By bleaching a print in lead ferricyanide multi-coloured pictures were possible by locally toning with various reagents. Mr. Purkis followed with a few remarks on panchromatic plates, which some years ago would have been informative to many.

In answer to many questions on the quartz lens, Dr. D'Arcy Power passed round some specimen prints from negatives taken with the "Kalosat" quartz lens working, it was stated, at *f*/5. They were really superb, combining good definition with slight diffusion of beautiful quality. The "Kalosat" is a meniscus single-lens, and compared with a crown and flint achromatised counterpart, is, he said, about 2½ times faster, aperture for aperture, owing to the quartz allowing free passage to the highly actinic ultra-violet rays. Contrasted with other achromatic objectives of greater thickness, or possessing many components, the comparative speed of the quartz lens would be proportionally greater.

As the dispersion of quartz is only about one-tenth that of crown glass, it is not necessary to rack the lens backwards after focussing, as is customary with an ordinary uncorrected single lens. The quartz lens requires to be free from strim, which if present will seriously impair definition.

With much acclamation a most hearty vote of thanks was accorded the accomplished lecturer for an evening of unusual interest. With only brief headings to refer to, he spoke with great lucidity and rapidity. The last feature places it out of the power of a longhand reporter to do justice to the discourse. Speed, however, was essential, as much ground had to be covered in a limited time.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE BEGINNER IN PHOTOGRAPHIC SOCIETIES.

To the Editors.

Gentlemen,—Few society secretaries will agree with A. V. W., whose letter in to-day's "B.J." plainly indicates that he regards "the absolute beginner" as little more than a nuisance. His proposal to admit to membership only those applicants who have had a year's tuition at a "school of photography" is not only an extreme view, but a dangerous one at a time when most societies are making great endeavours to extend their membership, and it should be scotched at once.

The beginner should be regarded as a society's greatest asset, for, if properly nursed, the photographic baby will very rapidly grow, and almost every batch of beginners produces at least one worker whom the society, two or three years after, is quite proud to own.

Every association should be a "school of photography" in itself. If it cannot number among its own members those who are willing and qualified to instruct beginners, adequate help may be had nowadays from other societies and from trade demonstrators. But the deficiency arises, as likely as not, only among newly-formed societies, or those who in the past have adopted the wrong attitude towards the beginner, and who are consequently reaping what they have sown.

As a rule a society will find it advantageous to supplement its usual weekly fixtures with a separate syllabus of demonstrations for beginners, and if the tyro continues to "butt in" during advanced workers' discussions, he can be invited to repeat his question at the appropriate meeting, or at least defer it until the close of the meeting, when the speaker can deal with the beginner separately, and so avoid slowing down or side-tracking the main stream of the discussion.—Yours faithfully,

W. H. Gleave.

Liverpool Amateur Photographic Association,
11, Dale Street, Liverpool.
September 15.

To the Editors.

Gentlemen,—The Utopian ideas of your correspondent, A.V.W., would have gladdened the heart of Sir Thomas More—the originator of the imaginary island—had he been alive to-day, but excellent as they are in theory, they do not come out well in practice. Your correspondent's arguments, carried to a logical conclusion, would mean that an amateur photographer would have to attend a photographic class, and get a certificate or something of the sort before he would be permitted to join a photographic society.

Most amateurs—probably 95 per cent.—take up photography as a hobby or pastime, and not as a business. Camera work is to them what fretwork, coin, stamp and butterfly collecting are to others. One does not go to a L.C.C. evening school to learn, say, stamp-collecting, and there is no reason why a would-be photographer should go to classes for photography—when he practices the art simply as a hobby.

Photographic societies are not what they used to be, say, thirty years ago, and I wonder if your correspondent realises the fact that the beginning of dry rot in photographic societies commenced when L.C.C. classes began. Had there been no cheap photographic classes (provided at the expense of ratepayers), photographic societies would never have lost their hold. My experience—probably an unfortunate one—is that L.C.C. photographic classes sometimes breed a species of photographic prig, an individual who, filled to the brim with ready-made knowledge, as per school curriculum, occasionally endeavours to teach his grandmother the gentle art of egg-sucking, and who has no desire or even any encouragement, to go beneath the surface and find things out for himself. It was those who had to find things out for themselves, and not the modern spoon-fed "expert," who made photography the beautiful and wonderful art it is to-day.—Yours faithfully,

An Old Hand.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

C. C.—The Barkay reflector is made and sold by Messrs. W. J. Bartholomew & Co., 40, Gerrard Street, London, W.1, who would readily tell you the best pattern to use in your circumstances, and also the distance from background.

W. M.—As a rule, the masks used for clouds in aerograph work are made of stout blotting paper, torn as the fancy of the operator dictates. You will find a great deal of useful information on this matter in "Sketch Portraiture," which our publishers can send you for 1s. post free.

E. P.—The following are the three chief French trade journals:—(1) "La Revue Francaise de Photographie"; (2) "Le Photographie"; (3) "L'Informateur de la Photographie." No. 1 is an amateur paper, No. 2 for professional photographers, and No. 3 for photographic dealers. All are published by M. Paul Montel, 35, Boulevard St. Jacques, Paris.

A. C.—The best recommendation we can make is that you soak the negative in a solution of soda bissulphite, or, if you have not any of this, in a solution of potass. metabisulphite, in either case of about 5 per cent. strength. It may take a long time, but this is about the best solution for removal of the bichromate stain. It would seem as though the particular plates you are using are extra liable to be stained by bichromate.

G. M.—None of these processes of converting a negative exposure into a positive bromide print are very satisfactory, owing to the somewhat thick film of the emulsion. The more thinly coated papers, such as are supplied for use in the Photostat machines, are more suitable, and for them a process was worked out a year or two ago by the Eastman Research Laboratory, and was fully described in the "B. J." of February 9, 1917, p. 68.

N. S.—A gas light of any kind is useless for your purpose, whether alone or as a supplement to daylight. You could, of course, use flashlight with advantage technically, but we do not think it can be recommended for your special purpose of the portraiture of children. If you really want to do the job effectively, you had far better have electric current connected, and instal one or two half-watt lamps to a power of about 3,000 or 4,000. You don't say what plates you are using. Perhaps you could reduce your exposure somewhat by using a very rapid plate.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. Established 1854. PRICE FOURPENCE.

TERMS OF SUBSCRIPTION POST FREE.

United Kingdom or Canada.—*One Year*, £1 1s. 8d.; *Six Months*, 10s. 10d.; *Three Months*, 5s. 5d.

Any Other Part of the World. *One Year* ..... £1 3s. 10d. *Six Months* ... 12s. 0d. *Three Months* 6s. 0d.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibits the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

Henry Greenwood & Co., Ltd., Proprietors and Publishers, 24, Wellington Street. London, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3256. Vol. LXIX. FRIDAY, SEPTEMBER 29, 1922. Price Fourpence.

Contents.

SUMMARY.

In a leading article we refer to the important proposal brought before the recent Congress of the Professional Photographers' Association for the co-operative advertising of portrait photographs. The scheme is based on the sound view that the competition which photographers need to unite in meeting is that of the vendors of other articles which, to a greater or lesser degree, are luxuries. We believe that the P.P.A. is the body which should initiate a scheme of this kind in the interests of the portrait photographers, both within and without its membership. (P. 586.)

Mr. John Mills, of Northampton, writes in support of the scheme, and adds the suggestion that it needs to be supplemented by the provision for the public of a suitable receptacle in which to keep portrait prints. (P. 598.)

At the P.P.A. Congress, Mr. Charles Aylett, of Toronto, gave a demonstration of less usual methods of lighting, consisting chiefly of various forms of back lighting. He made a strong point of the great commercial value of a soft-focus lens. (P. 590.)

The proceedings of the Congress ended with the annual dinner, and with the enthusiastic installation of Mr. Alexander Corbett as president for the current year. (P. 593.)

We publish this week, on page 592, a key to the members of the Congress group, reproduced in last week's issue.

In reviewing the landscapes in the pictorial section of the present R.P.S. Exhibition, Mr. F. C. Tilney concludes a most comprehensive and detailed survey of the pictorial harvest at the three exhibitions in London. (P. 587.)

The technical sections of the Royal Exhibition at Russell Square are stronger than in recent years. Lantern transparencies are a new feature. (P. 588.)

In the lantern slide section, Mr. Dudley Johnston shows a large number of lantern slides illustrating the methods which he uses for obtaining a wide range of tones by means of thiocarbamide developer. His working formulæ will be found on page 596.

In the colour section of the R.P.S. Exhibition, the Autochrome and other transparencies mark an average level of technique. Among the colour prints by far the most notable exhibit is that by Mr. Samuel Manners of prints by the Raydex method, showing a great advance in technical excellence. (P. 590.)

Mr. D. Charles sends us some excellent prints supporting his strong recommendation of flashlight for the portraiture of children. (P. 599.)

A correspondent gives the developing formula containing ferrocyanide, which at one time appears to have been largely in use in America. (P. 599.)

In the adjustment of intensity of illumination in a printing box appropriately to the character of the negative or of the printing paper, the most satisfactory means is a "damper" of the light consisting of one or more sheets of ordinary thin paper. (P. 596.)

In obtaining the best services from assistants more regard may often be paid to the avoidance of useless labour, a repitition of which lowers the efficiency of assistants, both physically and mentally. (P. 585.)

EX CATHEDRA.

The 1923 Almanac

With the smoothness and momentum acquired by many years of practice the "British Journal Almanac" (for 1923) is pursuing its accustomed path towards publication on or about December 1 next. Like time and tide the "Almanac" is one of those institutions which in the order of things laid down by the autocrats of our publishing department cannot wait in the progress of its production, not from any inherent perversity, but simply because contracts with printers and binders have to be exactly met in the case of a volume with an edition of 30,000 copies, each consisting of many hundred pages. It is, therefore, necessary specially to draw the attention of intending advertisers to the fact that the last day for the receipt of advertisements is

THURSDAY, OCTOBER 12.

At the same time our publishers ask for the assistance of those few advertisers from whom they have not heard, in the shape of the earliest possible intimation of their requirements in the forthcoming book. But immediately after 6 p.m. on October 12 the volume will be finally made up for the press, and, therefore, it is a remote chance that any stray orders which come in after that time can be accepted for the volume which will be in circulation next year.

* *

Time and Motion Study.

An assistant who spoke at the P.P.A. meeting called attention to the pamphlets on this subject to be obtained at small cost at the shop for Government publications in Kingsway. An example of the need for study of such matters in photographic establishments was that of an assistant called upon to make regular batches of copies with the ordinary studio camera. From the place allotted for pinning up the originals to the plate-changing bench in the dark-room was over twelve yards. The number of yards walked in pinning and centering the original and in switching on and off the lamps for each one was found to average another five. The very heavy dark-slide held only one plate, so that the total distance walked for each copy was about forty yards. Therefore, for every lot of forty or fifty copies made the assistant walked over a mile merely in getting the plates exposed. This is one example of many that could be cited to demonstrate the amount of time (and therefore money) spent in unnecessary labour. Still less is it realised that a secondary but serious result of such wasted effort is to induce a certain amount of mental and physical fatigue, and when carried to excess a feeling of resentment also, that has a very great effect of slackening speed and concentration upon the worker, especially towards the end of the day. The actual cost, therefore, of such unnecessary work is con-

siderably greater than can be calculated merely by the sum of the wages per hour taken up by that particular occupation.

* * *

Control of Printing Light. It is a mistake to believe that, in exposing bromide or gaslight papers, a short exposure to a strong light will give as good a result as a longer exposure to a weak one, even allowing that the actual illuminating value of one may be exactly equivalent to that of the other. Experience proves that with very thin negatives much more vigorous prints may be obtained by using a well-subdued light. This is easily obtained by increasing the distance from the light when using a printing frame, but most printing boxes, even when the light is movable, only allow of a variation of a few inches, when very often a good many feet would be necessary. Again, reducing the number of lamps is generally inadequate, a single 16 c.p. lamp being often too intense at close quarters. Probably the most satisfactory "damper" is made of one or more sheets of ordinary thin typewriting paper placed a few inches below the negative. When these are in position a thin negative actually appears to be stronger, and the sensitive film is evidently impressed in the same way. When enlarging, a similar result may be secured by stopping down the lens, a ground glass screen being placed between the light and the condenser.

CO-OPERATIVE ADVERTISING OF PORTRAIT PHOTOGRAPHS.

THE subject which more than any other aroused interest at the recent Congress of the Professional Photographers' Association was undoubtedly the scheme of national advertising for the stimulation of the demand on the part of the public for portrait photographs. Both the principles and the details of such a scheme were expounded in the very able and explicit address delivered by Captain F. H. Wright, of the London Press Exchange, who was followed on a later occasion by Mr. Hopton Hadley. The recommendations of these two advertising authorities tallied in almost all respects, and, therefore, it was not surprising to find that the scheme, as outlined, met with unanimous approval by those who listened to the addresses, and that, after some discussion, the matter was referred to the council for their report in due course to the members.

It is hardly necessary for us to recapitulate the advantages which a scheme of this kind offers for the expansion of the business of photographic portraiture. The examples of the benefit derived in other branches of commerce, details of which were given by both the speakers we have mentioned, are sufficient to show that under skilled administration a concerted scheme of this kind achieves results which could never be accomplished by indiscriminate individual effort, and does so at a fraction of the cost. Moreover, we referred to this very question as recently as in our issue of February 10 last, when we set forth pretty much the same facts which in greater abundance have been brought before the notice of the Congress. Still, it is desirable to underline one basic fact upon which a scheme of this kind rests; and particularly so, since precisely a contrary view appears to be in the minds of many photographers. It seems to be thought that for some reason or other a limit has been finally reached of the amount of money which the public as a whole will spend on photographic portraiture, and that, therefore, any advertising is simply a process of robbing Peter to pay Paul. But we are convinced that further consideration by those who may somewhat indefinitely hold this view will show that it is a fallacy. For example, one has only to look at the enormous growth within the last few years of studios offering photographs at relatively very low prices in order to see the great extent to which certain fresh classes of the community have spent money on photographs which previously they spent on something else. There you come to the crux of the question, namely, that the competitors of an individual photographer are all the other traders who offer goods of a kind which are not necessities of life. They are the competitors at least as much as the other photographers in his district, to whom chiefly he has directed his attention in meeting competition. Hence follows the altogether sound doctrine that photographers as a whole should unite in putting into effect a common policy directed to meet this competition from the vendors of other goods which may be classed as luxuries or semi-luxuries. Propaganda of that kind is bound immensely to benefit photographers as a whole.

When we turn from the general question to practical ways and means of carrying out such a scheme, the subject offers several debatable points. As was suggested by both the speakers at the Congress, the Professional Photographers' Association, as the representative body in the Kingdom, undoubtedly should be the one to bring a scheme of this kind into being. On the other hand, the P.P.A. has at present a membership of about 1,100, which is approximately one-seventh of the total estimated number (8,000) of portrait photographers in the United Kingdom. It is, therefore, perfectly clear that in organising a scheme of national advertising the P.P.A. cannot leave the six-sevenths out of consideration. It must enlist their support, or at any rate the support of a considerable number of studios outside its own membership. If the P.P.A. takes up this question on the broad basis of benefit to all photographers throughout the Kingdom, we think there is no doubt it can obtain the degree of co-operation which is necessary. Moreover, it is a reasonable anticipation that manufacturers of photographic goods would take a share as contributors to a scheme which necessarily would benefit them appreciably, if in lesser proportion than portrait photographers themselves. But the scheme must be organised in this single aim, and the Association be prepared to regard the increase of its membership as a benefit incidental to its larger national work. We think it will not do to mix these two aims in approximately equal proportions, and we mention this matter because already there are signs that the scheme is regarded in this two-fold aspect.

It may, indeed, be suggested that for the purposes of a national advertising programme a body should be formed, financed by the contributions of studios within and without the membership of the P.P.A. and placed under the control of trustees, likewise chosen from those who are members and those who are not. Whatever plan may, however, be adopted for enlisting support on the widest basis, there can hardly be any doubt that the practical management of the scheme is one for the advertising expert, whose business it is to make the psychological appeal to the public and to employ the channels of Press advertising of which he has an intimate knowledge. We daresay that an advertising man would welcome the opportunity of bringing before the public articles, such as portrait photographs, which particularly lend themselves to so many different and attractive forms of appeal. The booklet issued to members of the Congress by the London Press Exchange served to show the forcible advertisements which could appropriately be used.

THE EXHIBITION OF THE ROYAL PHOTOGRAPHIC SOCIETY.

In continuing a notice of the Exhibition of the Royal Photographic Society, now open at 35, Russell Square, London, W.C., we publish a further review of the pictorial section by Mr. F. C. Tilney, in which he deals particularly with the landscape and architectural exhibits which at the Royal this year form a fairly large proportion of the whole collection.

The scientific and technical exhibits are this year more highly sub-divided than has hitherto been the case, and have been separately judged by a correspondingly larger number of committees. The natural history section, notice of which will appear in a later issue, is the largest and best which the Society has ever brought together. The section "Technical Applications of Photography" has perhaps a somewhat misleading title, since the chief exhibits in it are those illustrating the properties of emulsions, forms of silver bromide grains, and examples of other research work done with the purpose of advancing the manufacture or use of photographic materials. However, the finer arrangement of examples of technical photography is a step in the right direction, and no doubt will have the result of attracting a greater number of contributions in future years from those engaged in these branches of work.

LANDSCAPE IN THE PICTORIAL SECTION.

The example of the landscapists of note is having the effect of bringing forward the obscure worker with more definite self-expression, and it is imbuing others with a righteous determination to share the ground with the eminent ones. A pleasing feature of this Exhibition is the appearance of fine work by photographers who have not yet won the reputation they deserve. Thus we have the names of Ashbee, Reece, Pickwell, Unsworth, Beauchamp Hall, Gleave, and others bringing honour to themselves and to the Exhibition; whilst men like Bairstow, Felton, Keith Dannatt, Lomax, and L. Banfield stake their claims with the few whom we accept as gifted.

From Australia comes the work of A. Wilkinson—"Monarch of the Glen" (64) and "Overlooking the Plains of Adelaide" (69), the latter a noble Claude-like subject, quite straight, and treated with much feeling. But perhaps the heartiest congratulations are due to W. H. Ashbee for three excellent landscapes, "A Downland Farm" (5), "The Arun" (14), and "The Druids' Table" (90), which is the best. It is a fine, expansive view from a hill-top, where there is what looks like a cromlech in the form of a seat or table. Two men on a lonely shore that is bathed in misty light is the subject of C. J. Unsworth's "Gleaming Light and Evening Grey" (70). The sun reflections in the shallow ripples are very effective. W. L. G. Bennett's mountain path, with a capital sky, and called "A Gleam through the Clouds" (74), has romance and feeling; and another good mountain scene is "Newlands Pass" (37), by W. T. Graham. A happy composition and effect comes from Dr. C. Beauchamp Hall in "Softly Fall the Shades of Evening!" (80). Perhaps the light reflected in the stream from the sky is relatively over-bright, both for nature and pictorialism. In "The Common Task" (124) H. Pickwell has achieved with much truth the effect of a sultry sky over a distant town. On the near shore of a stretch of water are the washing places for laundresses, one of whom is seen at her task. This is a work of immense promise. W. H. Gleave also raises high hopes by his picturesque "Italian Lakeside" (130), which has a full variety of tone and excellent composition. The charm in G. C. Weston's "On the Moorland" (93) is traceable to a concentration of light in a grand subject. His "Surrey Lane" (123) is delightful, too, in its variety of tone. Less varied, but of considerable feeling, is J. Ainger Hall's "Hurley" (122). White houses, black roofs and dark mountains make up A. V. Insole's striking "Jenerilfe" (42). A desolate scene in a manufacturing town is made pictorially beautiful in Miss G. Openshaw's "Winter in the North" (107) by sunlight and its glints upon a little stream that runs by a shed and a tall shaft. Miss E. Chatterton also had an idea in her shadows of trees upon a field in "Morning Shadows" (115); and the highly figured reflections in water form the idea of H. G. Allen's "Reflections" (131); whilst in "The Month of March" (134), by J. J. Butler, the idea is evidently of melancholy. Stanley Watson's shipping scene, "Lowestoft" (139), is quite distinguished. All these works would have been exceptionally fine years ago; to-day, good as they are, they constitute the general level of this Exhibition.

Among the more familiar names we find A. K. Dannatt, with his Dutch figures in "Homewards" (35), whose shadows are inexplicable, but of which the feeling is indisputable; Herbert Felton, who gets the true touch in "Evening in the Pines" (34), and whose "Guildford" (38) is one of the ornaments of the show, in spite of its unmodulated sky. Harry Abbott, junr., with his good "Storm Clouds" (57), and "The Cumulus" (51), by Chas. F. Stuart, beautiful in effect but unnecessarily low in key. Then H. Y. Sümmons surpasses himself with a splendid arrangement of tones and masses in "Arch of Constantine" (153), and uncommon feeling in "Night's Approach" (76). Frank H. Read sends a fine panorama of "Rouen" (15). Lewis E. Banfield, a striking but rather mixed-up group of orientals, smoke, and a gleam on a wall in "Hasheesh" (77). From A. C. Banfield comes a first-rate composition, with a big clump of elms, called "A Sussex By-road" (81), and a real sense of light and open-air in "On the Edge of the South Downs" (89). Very fine skies are the great feature of two landscapes by J. B. Portway, senior, the latter being "The Track" (91), with its gleaming sea margin. H. W. Bennett gives us the over misty "Durham" (92). But one of the most startling pictures for truth of effect is the "Arrens" (73), with its wonderful sunlight in the street, by M. O. Dell; and that is run pretty close by H. van Wadenoyen's "Sunlight on Stone Wall" (82), an exercise of much quality. Snow in the woods and the shadows on the ground give us "Nature's Carpet" (85), designed by S. Bridgen with proper regard to the value of a broad space.

Four of F. Judge's exquisite little pictures will be welcomed, particularly the "Dover" (144), a shipping subject, and, best of all, "In Glean Lean" (143), which rises to the height that Mr. Judge reached when he first exhibited his oil transfers. It is a very delightful scene, wherein the placing of two sheep to carry the light spot in the scheme is masterly. Charles Job, likewise, does not fall below his own standard in "The Arun, near Bury" (147), a work of much feeling. I think the light on the river to the right might have been a thought less bright with advantage. And I would also suggest that in Alex. Keighley's very noble subject, "The Hillside Road" (60), a little more daylight on the road would correspond to our experiences of the condition he depicts—more, in fact, as the reproduction in the catalogue renders it. "Tranquility" (58), his other work, is a placid stream reflecting, very dimly, the white houses upon its banks. There is a capitally designed tree on the right, which completes the pictorial effect.

T. H. B. Scott is revelling in dark tones this year. His "Threatening Weather" (36) would surely be even finer than

it is for a little more light on the horizontal planes. In "A Pyrenees Team, Lourdes" (68), he uses grand material, with the same dark method, which certainly gives him richness and quality in the print, though it does so at some sacrifice of delight on the part of the nature-lover. "The Old Church, Lourdes" (135), has not the excuse of "threatening weather," for it was photographed on a halcyon day; yet we are able to see far into the depths of the shaded parts of the building, the sunlight on the ground before our eyes notwithstanding. But there is luminosity in the sky, because of its tender gradations.

Bertram Cox, in "The Face of the Down" (55), has favoured the unconventional. His foreground object here is the immense side of a chalk cliff that we see over the edge of its upper surface. So big is this feature that it almost, but not quite, makes up for what it loses in strength of tone as a foreground object such as he gives in the big clump of elms in "Arun Meadows" (121). This work is therefore the more effective pictorially, though it has not the charms of the distant parts of "The Face of the Down." Mr. Cox's big trees are always fine, they have such life and character, and are so round and solid in their light and shade. Those in "Sussex Elms" (133) are of that variety of which the stems are kept trimmed, and are therefore clothed with short shoots of verdure. "Evening on the Arun" (65) is a little complex perhaps, but is full of feeling.

Landscapes from Abroad.

Of course, the attractiveness of our shows are always helped by contributions from the Colonies and Dominions, besides those from the Continent. There are five gentlemen whose works, here, have been much admired, and yet in photography, as in the other media, landscape remains an English art. Dr. R. S. Lovejoy shows remarkable feeling in "Nature's Spires" (21), which are poplars before a broad and well-gradated sky; whilst there is scarcely anything else but feeling, and plenty of it, and of the true poetic sort, in August Knapp's perfectly simple "Dawn" (44) and "The Poetry of a Distant City" (47). These little poems come from West Australia. Dr. Lovejoy's come from Maine, U.S.A., whence also do the works of F. O. Libby, well-known in our galleries. One of the most successful he has ever sent, because the most truly naturalistic, is "The Lake Below the Hill" (24), one of the nocturne subjects he is so faithful to. Here the moon shines down into a misty hollow, where a gleaming lake is seen between the branches of a fir-tree in the foreground. J. P. Edwards, of California, sends also a remarkably poetic architectural subject called "A Sierran Temple" (48), with a wonderful sky; and in "Hague Street, New York" (128), a great arch, most impressively rendered. N. P. Moerdyke is from Los Angeles. His "On the Wharf" (20) gives an artistic culmination of light upon a man's shirt in a mass of material treated with skill and showing much quality. Then we have our old friend Leonard Misonne, whose three landscapes are a welcome addition to the show. They are rather a departure from his usual style, and therefore exhibit further resources and talent. The steaming plough-team in "Attelage Fumant" (27) shows more realism than usual, whilst "Jeunes Pêcheurs" (22) is firm and dark, and not a bit misty; with its two children, at middle distance, by the water-side "Aurore" (54) gives charming gradations of light among small trees.

Architectural Subjects.

The Royal always preserves the traditions of its early days, when churches, cathedrals and ruins were the main objectives of pictorial photography; and it is thus fitting that the ex-president, Dr. Rodman, contributes a view of ruins in "Ludlow Castle" (94). In modern days we show, perhaps, less sympathetic veneration for the past, as past; but more enthusiasm for its appearance under natural effects. It is this which gives us interiors with a mood like W. Archer Clark's "Ray of Sunlight, Ely" (138), A. Stephenson's beautiful study of light beams among arches and piers, called "In Softened Light the Sunbeams Pour" (119); likewise the illuminated courtyards, such as J. A. Lomax's "Sunlit" (49), a first-rate study, and "A Sunlit Courtyard" (53), taken from a shed, by Frank H. Read, with beautiful quality; and the strange circular doorway with light beyond in "From Cell to Courtyard" (86), by Dr. N. Hay Bolton. In street scenes, mention has already been made of one or two works; but the visitor should note G. Bellamy Clifton's "Old Bristol" (40), with its nice rich shadows; "The Pantiles" (32), by W. C. Squires; the highly picturesque "St. Goarhausen" (116), by Herbert Bairstow, a narrow street with a man and a child, and his "Filsen am Rhein" (126), where a woman is just entering the shade of an arch, both interesting in their gothic quaintness. F. G. Tutton turns to the classic with his damsel on a renaissance seat, "At the End of the Terrace" (109). Here good use has been made of the shadow that falls across the marble structure. Modern architecture shrouded in misty light, and seen behind the sharper pattern of slender tree-stems, is the theme of Miss C. Sipprell's "City Hall Square, New York" (98). As an exercise in composition with rectangular lines Lewis L. Banfield's "The Sunbaskers" (61) would be hard to beat. The big column at the back is most artistically receding and yet dominates the scene. As a tone-study also this work is very fine. Alfred J. Wood does well in getting the relative tones of a church, with lighted windows, against a night sky, which he calls "Light Amid the Encircling Gloom" (105), and a more pictorial attempt has been made by R. H. Bullen with "The Fox Inn, near Letchworth" (33), but I fear that it is too full of anomalies due to the artistic after-touch to maintain its interest after the first glance. To conclude with Horace Jackson's "A Chinese Tea Vendor" (43), we see how the lines of steps and awning have made a theme in composition emphasised by the darker tones of the shaded parts.

It is really a grand Exhibition, and this estimate was attested by Mr. Solomon J. Solomon, R.A. who opened it on Saturday last. He referred to the "splendid" composition of the subjects, and particularly pointed out the merit of the landscapes; as well as giving a tribute of praise to the effective display of slides and coloured transparencies in the rooms above. These are, indeed, shown this year to the best advantage. A notice of this sort should not conclude without a reference to S. Pegler's Autochrome stereoscopic subjects, of which there are two cabinets. Never before has the quasi-realism of stereoscopy—often a gross exaggeration of the third dimension—been given with so much convincing truth and surprise at its beauty; for the Autochrome becomes quite another thing in this method of showing. Mr. Solomon was enthusiastic about a certain picture of jewels and diamonds. He said: "They made my mouth water"—they would; but they are above my station in life. I yearned to be in "Sherwood Forest"; indeed, I felt I was there among the tawny bracken—a rich and restrained and yet brilliant scheme of colour.

F. C. Tilney.

THE TECHNICAL SECTIONS.

Examples of a process of producing accurate scales without the use of a ruling machine are shown by A. E. Bawtree (268). Mr. Bawtree uses a copying camera, double-toning, and expansion or contraction of a paper print as steps in his method of producing finely divided scales serving such purposes as conversion of weights and measures, thermometric scales, etc. The relation between the size and the number of grains in an emulsion is shown by curves (269) obtained by A. P. H. Trivelli and F. L. Righter from measurements which must have been extremely laborious. The recent researches of Loyd A. Jones

on the gloss of photographic papers are illustrated in No. 270, which shows four papers of different degrees of gloss, and, for each, the distribution of the light reflected from the surface. According to the definition of surface reflection adopted by Mr. Jones, the matt paper has a gloss of .92; the semi-matt, of 1.8; the semi-glossy of 4.1 and the glossy of 24.2. Dr. Sheppard, in some photographs (272) of the shapes assumed by cubes, spheres, etc., of gelatine when drying, illustrates the great strains set up in gelatine in process of dessication, as exemplified in the by no means uncommon phenomenon in which the surface of a glass plate is torn away by a contracting gelatine film. Photographs of the apparatus used for the measurement of the visible graininess of photographic negatives are shown by Arthur C. Hardy (273). An interesting illustration of the degree of definition obtainable in photographs of the surface structure of planets is shown by Frank E. Ross (274). The definition represents objects no larger than 1½ miles as they would appear when photographed with the Mount Wilson reflector telescope of 270 ft. focus.

The various forms of crystals of silver bromide occurring in dry-plate emulsions and in other silver preparations are shown by A. P. H. Trivelli (275-6), and are extraordinarily perfect photo-micrographs taken at a magnification of 3,000 diameters. These may be compared with a further series (374) by J. Willis Grundy of silver bromide grains from ammonia solution photographed at 1,000 diameters.

Some interesting examples of the photographic examination of forged documents are Nos. 356-359, by Wilfred Mark Webb, in the shape of reproductions of a Russian internal passport, showing the numerous falsifications which had been carried out for the purpose of use of the passport by others than its original holder. Unfortunately, no details of the method of examination are given. Mrs. M. Dickinson, in No. 300, shows a pair of photographs illustrating what appears to be a method of removing scale from boiler tubes by radio active material. The photographic interest is small, and the omission of any details of the process illustrated is, therefore, all the more unfortunate. The most notable examples of photographic methods of industrial research are the series of photographs (365-372A) by Philip P. Quayle, of the United States Bureau of Standards, showing the course of bullets through various materials.

Colour Cinematography.

Colour cinematography is represented by the single exhibit (387) of John G. Capstaff, illustrating the two-colour or Kodachrome process of the Eastman Research Laboratory. The film negative is taken alternately through red and green filters and a positive made from it. From this positive printing is done by a system of optical projection on to opposite sides of a double-coated film, the alternate images of the positive being thus produced as registering pairs of negative images, that is to say, one image of each pair is on one side of the film and the other on the other. This duplex negative film is bleached, fixed and converted by a reversal process of dye toning into a two-colour positive film, in which the red-sensation images are toned blue-green and the green-sensation images, red. The examples show the clearness and brightness of the films and the suitability of the process for close-up portraits.

Astronomical and Aerial Photography.

The astronomical and aerial sections of the Exhibition contain some excellent examples, clearly demonstrating the advance that photography has made in these difficult branches. No. 289, "Great Nebula in Orion," by the Mount Wilson Observatory, is worthy of praise. Other photographs of various nebulæ are Nos. 277-289, by Dr. J. S. Plaskett. "A Giant Group of Sunspots," No. 281, by the Astronomer-Royal, is interesting, and the "Unusual Spectra of Seven Stars," by the Mount Wilson Observatory, is difficult work well done.

Aerial cloud studies by F. W. Baker, F.R.Met.S., are fine work. His No. 282, "Strato Cumulus from 7,500 ft.," is a cloud landscape. Some illustrations of upper cloud formations by G. Aubourne Clarke show great care and study. Examples of aerial photography by J. Willis Grundy are worthy of notice, his No. 382 being especially interesting. Print No. 2 under this number demonstrates the value of a red-sensitive plate, and a naphtholdisulphonic acid filter.

Photo-Micrography and Radiography.

Much excellent work is shown in these sections, particularly noticeable being the rock sections, by C. H. Caffyn; his No. 300, "Six Sections of Calcareous Rocks," gaining the medal. Photo-micrographs of typical animal hairs, and hairs on leaves of plants, by Dr. G. H. Rodman, are extremely good, as also is his No. 306A, "Under Surface of Leaf of Goosefoot."

Amongst the radiographs will be found some fine work by N. E. Luboshey. The medal in this section has been granted to No. 332, "Sarcoma," by A. O. Forder. An interesting radiograph negative is shown in the Transparency room; it represents a fish which has swallowed a whelk.

Stereoscopic Photography.

The stereoscopic prints are the work of Messrs. Ralph Chislett and Oliver A. Weiss. No. 421, "Merlin and Young," by the former, is particularly noticeable. The stereoscopic transparencies by A. T. Mole should be seen, a group of old Dutch fishermen being especially good. Two cabinets of colour stereos in the Autochrome process, by S. Pegler, F.R.P.S., are interesting, No. 32, "Dessert," standing out well. In Cabinet No. 439 an Autochrome positive of a pot of flowers is shown, and also a negative in complementary colours of the same subject.

Lantern Transparencies.

The Royal Photographic Society is to be congratulated upon the improved method of displaying the colour transparencies and pictorial lantern slides. In past years one felt loth to enter this room, which was lighted by many incandescent gas lamps, and the temperature of which could only be likened to that of a Turkish bath. The present system, however, using direct diffused electric illumination, is a great improvement, and the transparencies and slides are shown to greater advantage. The large number of lantern slides which have been packed in the stand provided makes the viewing of them very difficult, and while there is some excellent work shown, some slides would have been better left out. Nos. 441 to 536 are a loan section by members of the Manchester Amateur Photographic Society selected by Jas. Shaw, and are not for competition. This collection includes some fine work, especially that by Mr. Shaw himself. His figure studies, Nos. 450 to 452, are particularly good. The snow studies by S. L. Coulthurst are well worth notice, as also are slides by J. D. Berwick and W. W. F. Pullen. Amongst the competition slides are several that badly require spotting, and some we noticed have been spotted in a red coloured pigment that does not look well on a dark toned slide. Some of the slides also are rather weak. The hand-coloured slides, although exceedingly well done, are quite out of place. Amongst the slides which stand out well in this overcrowded section are the set by Wm. Archer Clarke, Nos. 639 to 650. His No. 647, "The Shadow," gains a medal. Dr. G. H. Rodman shows some fine studies of dogs' heads, and Ranald Rigby's "Cut Glass" (No. 599) is good clean work. We admired the fine technique of Edgar R. Bull's slides of Penshurst, especially Nos. 666 and 667. A most interesting set of slides is included by J. Dudley Johnston, Nos. 686 and 687. The former represents 30 slides illustrating the factors governing colour in lantern slides when using a developer containing thiocarbamide, and the second set is of 10 slides showing the influence of variation of the thiocarbamide in the developer. These slides show the methods used by Mr. Johnston in his extraordinarily skilful practice of making lantern-slides of various quiet degrees of warmth of colour.

COLOUR TRANSPARENCIES AND PRINTS.

In the past one has never been quite certain whether the Autochromes and other colour transparencies were judged at the Royal on their pictorial or technical merits. This year they are definitely brought within the pictorial fold, and have been judged by a committee, charged, as we suppose, to make its awards purely on the basis of the æsthetic qualities of the exhibits. We daresay that they found that it is much more difficult to do this in the case of colour transparencies than in that of monochrome prints which are put forward as examples of pictorialism, and considering the very small opportunity, beyond selection of the subject, which there is for pictorial expression in the Autochrome process, it is greatly to be doubted if there is a real advantage in leaning towards this view of the process and definitely labelling other colour work as "scientific" simply because the subjects are of a scientific character. However this may be, a medal has been awarded to an Autochrome study of still life (766), by Bertram H. Saunders, entitled "A Good Dinner." It is quite a good dinner, including a pheasant, trussed fowl, joint of beef, and many pounds of vegetables, and we commend the reserve of those who arranged the transparencies for placing a study by the same author of dessert fruits in quite another part of the collection. The judges must have had a good deal of difficulty in deciding between "A Good Dinner" and the Autochrome "Neapolitan Type" (695), by N. E. Luboshey, which technically, we think, is a much better example of the process, and pictorially at least as good. Another medal is awarded to F. G. Tutton for a three-colour transparency of still life (706) by the carbon process, in which the colours have been strengthened with dyes.

This year the flower and fruit transparencies by Henry Irving are again of extremely beautiful quality, though perhaps not superior to those of last year. His best, we think, is No. 696, of sweet peas. Most of the landscapes do not rise above the ordinary, but there is a beautiful study of birch and bracken, "Autumn Gold" (713), by Henry E. Harris; another, "Heather" (776), by W. Scruton; and a fine series of Corsica (783-790), by Major T. W. Bartlett and Miss E. M. Bartlett.

When we come to the colour prints we are bound to say that, in our opinion, the presumed policy of judging the work as part of the pictorial exhibits has proved a mistake. In the present state of the technique of making colour prints on paper every encouragement should be given to the production of work which marks a technical advance as regards registration, purity and brilliance of colours, absence of predominant tints, and other qualities which in the past it has been so difficult to overcome. The pictorial application of the technical methods may very well be left to itself for a while. Thus, while the "Figure Study" (392) in the three-colour carbon process, by Leo. G. Nicoll, who receives a medal, has many pictorial merits, this single award undoubtedly overlooks the remarkable progress in the making of three-colour prints by the Raydex method exhibited by Samuel Manners in Nos. 396-402, all of which mark a great advance in the technique of this method, which Mr. Manners has long worked to perfect. Even the hanging committee seem to have had a grudge against them, for they have put them on the dark side of a screen where they cannot be properly seen. These exhibits by themselves make the colour-print section the best which the Society has had for many years. The others do not make a very strong show, although Commander H. E. Rendall has a very pleasing version of sunshine and colour in No. 413, "The Gardens of Villa Frere, Malta," also by the Raydex process.

THE P.P.A. CONGRESS.

The concluding portion of the reports of the crowded week of fixtures arranged by the Professional Photographers' Association for the recent Congress appears below. Owing to the considerable number of the papers and demonstrations which formed the programme, we have had to abandon a datal order of the proceedings, but all the fixtures have now been dealt with in our pages. The Congress came to an end with the installation, at the dinner, of Mr. Alexander Corbett as President of the Association for the current year. Elsewhere in this issue appears a key to the members who figured in the Congress group reproduced last week.

UNUSUAL PORTRAITURE.

On the Wednesday evening of Congress week the lecture was by Mr. Charles Aylett, of Toronto, whose subject was "Unusual Portraiture, introducting Spot Lighting and Soft-focus Lenses." The chair was taken by Mr. W. L. F. Wastell, President of the Royal Photographic Society.

Mr Aylett said that it had been an eye-opener for him and for his colleague, Mr. Kennedy, to see the present exhibition. He had no idea that such wonderful and beautiful work was produced on this side. He had seen a few photographs of British origin at Conventions in the United States—not so often in Canada—and they had always been of a very high standard, but he had "figured" that these were by men who were advanced amateurs and were made for exhibition purposes. Now he understood that it was everyday work, and he could not help congratulating the Association upon the finest exhibition of portrait photographs he had ever seen, and he had seen a great many, having attended at least five Conventions in the United States and Canada this year.

The average picture they got in the States and in Canada was just that "honest to God sort of photograph, don't you know," which had every technical excellence, but the pictures in this exhibition showed him that their producers were aiming at the ideal. Many of the pictures, and particularly the one that had won the first prize, had a mystery about them and a harmony which was very often absent from the pictures on "the other side," good as they were. He went on to speak about the value of Congresses. Their supreme value was in the opportunity they afforded one to know one's fellow photographers. In their atmosphere all unwarranted jealousy disappeared. If any of them had any new device or process or idea he was very glad to demonstrate it to someone else. They liked to show it to the man round the next block. He would not imitate it, or, if he did, he would not do it in exactly the same way. And if he worked out something a little different it helped him along, and did not do his colleague any harm. All of them could show one another new ways of doing things, although for his own part, he dipped his pennons to British photographers, and seriously doubted, after seeing their exhibition, whether he could show them anything in particular. He was supposed to talk about soft-focus lenses. He used soft-focus lenses every day in the week in his studio, and had done so for the last eight years. He believed in soft-focus lenses. He did not think that soft-focus lenses were a fad. They were something which had come to stay. They gave him, not so much a photograph of some hair, as an impression of hair. The things looked real to him as seen by the soft-focus lens. He had made more money by the use of soft-focus lenses than by the use of anything else. He would never have been able to come over to England had it not been for soft-focus lenses. When he told them about the rewards to be made in Canada from the use of soft-focus lenses, he rather expected that all the men using soft-focus lenses would be coming over to the Dominion pretty soon. The results with the soft-focus lens approached nearest to brush effects He did not think that their sitters or their sitters' friends wanted to see the hard drawing, the wiry portrait. They wanted to feel that the resemblance portrayed the spirit of the person concerned. The spirit could not be put on paper, but something of its subtlety and softness could be caught, so that another person, looking at the portrait would say, "That is mother! That is father!"

referring not to the contour of the features, but to the suggestion of the personality, and this could best be given by the soft-focus lens.

Mr. Aylett then went on to explain that Mrs. Aylett would act as his model that evening. An installation of Osram gas-filled lamps had been fitted for him, together with a black felt ground and a white felt ground, one or other of which he always used. A necessary property was a Paisley shawl, which he used as a screen. Coming over to London he had imagined that such a shawl would be readily procurable, only to find out his mistake. However, in Oxford Street, he had managed to get some kind of a substitute. He was accustomed to use, with his black felt ground, a small 300-watt lamp behind the subject. The lighting installation on this occasion was not quite that to which he was accustomed. The light behind the subject in this instance was 1,000-watt lamp, and he had to make special arrangements to tone it down with paper screens to somewhere about the equivalent of a 300-watt lamp in a bulb-shaped reflector. This served to cut out the light from the subject, and reflected on to the background, giving him a little corner of illumination on the dark felt. He thought that this was a point worth remembering. On looking at the lighting scheme of most of the painter artists it would be observed that if they were using a dark ground, one corner would be lighter than the other three, and if they were using a light ground, one corner would be darker than the other three. By his method of using a small light in a bulb-shaped reflector and throwing this light on to his dark background, he obtained such an illumination behind his subject as made his subject and his background more completely one. The subject no longer stood out from the background. He did not like the subject to stand out; he liked the subject to stand in and to belong to the background. To him, at least, there was a feeling of unpleasantness if the subject jumped out at one, though he could not offer any scientific argument in defence of his taste in this respect.

In addition to this light behind the subject he had two other lamps on the opposite side of the subject, and slightly in front. These were subdued with white paper screens. Some light muslin was stretched at one side—the side of the single lamp—and on the other side some darker fabric or the Paisley shawl; and the sitter herself was dressed in black hat and cloak. Mr. Aylett said that he would try to work as he worked at home, although allowance must be made for somewhat different conditions. He used, of course, his soft-focus lens, remarking that he had at least seven or eight soft-focus lenses, and every few months he came upon the best lens of the kind he had ever used, only to discard it later in favour of another, which really *was* the best. He always worked in a very low key, and he agreed with what the President had said in his address from the chair about the value of long exposures. He never tried to make snapshots in the studio, but quite customarily gave up to three or four seconds. With a long exposure one was more likely to get a composite expression, furnishing a better indication of character. In making a three-quarter portrait of a sitting figure he always crossed the knee that was closest to the camera. It was a disputed question whether the eyes should be made to look directly into the lens. He did not himself make many pictures in which the eyes looked into the lens. He knew one photographer in the United States, who told him that his business amounted last year to 110,000 dollars, who rarely made a picture in which the eyes "did not look bang into the lens"; he said that such pictures always sold, but the speaker's own preference was for the eyes, at least very frequently, to be turned away. Mr. Aylett at this point in his demonstration, when about half-a-dozen members of the audience were assisting him in his arrangement of screens, or in suggesting poses for his model, remarked that the plenitude of assistance rather embarrassed him; he had never had an assistant in his life and had done all his work himself.

With regard to spot lighting—which he always preferred to call back lighting—this was an element which should be introduced only in carefully selected subjects. There were occasions when its use was quite legitimate, but it had been overdone and abused. He himself only used spot lighting or back lighting, just to give a little "snap" when this seemed to be necessary. He always worked the spot lighting or back lighting as close as he could without getting the beam shining into the lens. With the aid of a projection lamp held behind the sitter, on the opposite side to the single lamp for illuminating the background, he showed various spot light effects, demonstrating how an interesting line of light could be made to run up one side of the face, or to add by some other stratagem to the interest of the profile. He rarely used the spot light on ladies who had dark hair. The best subjects for this treatment were those whose hair was fair and soft and fluffy. With dark hair there was apt to be a "splashy" effect. It was also very necessary not to make this particular light effect too continuous. It should not be made to surround the profile, but only to appear here and there and be lost again. It needed very delicate manipulation, otherwise it might suggest something which had been cut off with a razor.

Mr. Aylett made one or two exposures with a large studio camera, remarking in doing so that he never exactly timed his exposures; "you just feel that it is right." Subsequently he abandoned the camera, so that the audience could better see the effects, and tried various schemes of posing and lighting, in particular pointing out how the 300-watt lamp behind gave relief and interest to one side of the picture. He also tried some effects with a white background with the Paisley shawl across a large corner of it. Sunlight and pleasant shadow effects, not too brittle in line, were thus secured.

It must be added that the interest of the compositions was greatly assisted by the singularly beautiful model, and Mr. Aylett recalled the remark of Snowden Ward, that a good photograph must be something beautifully photographed, and not merely the photograph of something beautiful. But they well knew that 50 per cent. of the success in photography was attributable to the original beauty or distinction of the sitter. Beautiful photography could certainly be done on someone who was not prepossessing, but how many of the photographs now on the wall would be hung were it not for the beauty of the living original? He concluded by saying how amply he had been rewarded for his trip across the Atlantic, and how glad he would be to feel that he had helped anyone.

At the close of the lecture the Chairman proposed a vote of thanks. Alluding to the many members of the audience who had rendered Mr. Aylett assistance by holding draperies or shifting the camera, he said that he had never in all his life seen so many professional photographers on their knees. (Laughter.) He had himself learned a great deal. He had learned why he could never take portraits. His methods both in posing and in lighting were more casual, and he was afraid that none of the sitters to whom he was accustomed would exhibit the patience of the very beautiful and attractive model whose services Mr. Aylett had been fortunate enough to command.

The vote of thanks was carried with acclamation, and Mr. Aylett, in reply, said that this was the proudest day in his life "since the day I married her."

The President (Mr. Swan Watson) expressed thanks to Messrs. Houghton's, Ltd., for the loan of apparatus, and to the General Electric Co., Ltd., for the loan of lamps, and the services of their representative, Mr. Rondle. Then, without the presence of the President of the Royal Photographic Society and his humour and good sense, they could not have had quite such a happy evening, and he wished him, in the name of the Association, a most successful year of office.

During the evening Mr. Kennedy read a letter he had received from Mr. Howard D. Beach, of Buffalo, New York, immediate Past President of the National Photographers' Association of America, who hoped to visit London at the next Congress. One sentence of his letter ran: "Take to the boys of the Congress the best wishes of the Buffalo Section No. 6 of the P.P.S.N.Y. for a great meeting and subsequent prosperity for all." (Applause.)

STATUTORY GENERAL MEETING OF THE ASSOCIATION.

The Statutory General Meeting of the Professional Photographers' Association of Great Britain and Ireland, Limited (adjourned from March 10, 1922), was held at Princes Galleries, Piccadilly, London, on Friday, September 15, 1922.

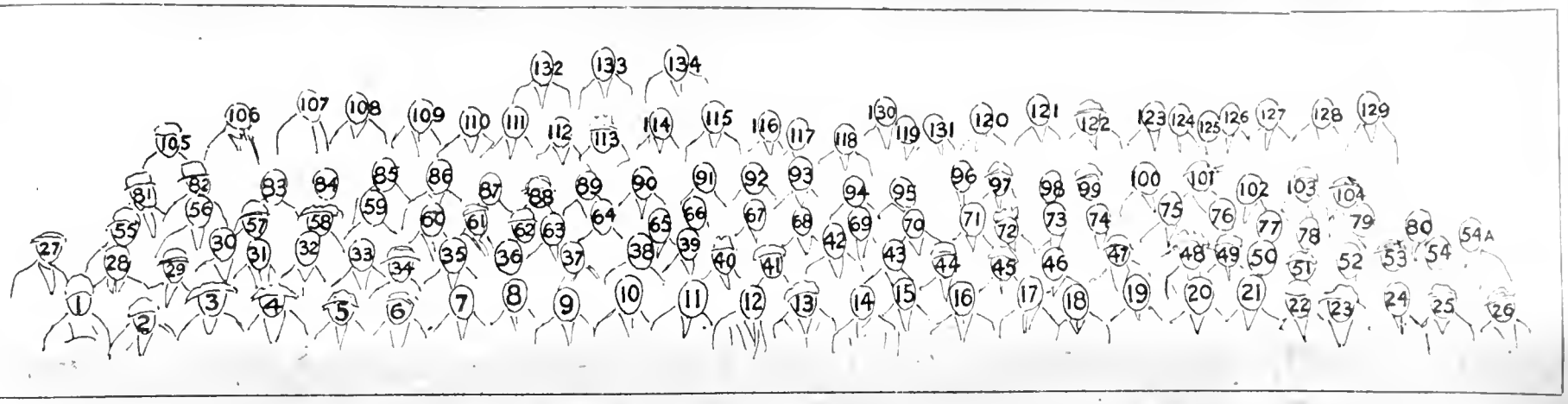
Mr. A. Swan Watson (President) was in the chair, and about sixty members of the Association were present.

The Secretary (Mr. Alfred Ellis) having read the notice convening the meeting,

The President explained the purpose of the meeting, which was to complete the business of the previous General Meeting of March 10, when the Statutory Report and the General Report of the Council and the Treasurer's Statement of Accounts were adopted.

On the motion of Mr. F. Read, seconded by Mr. Mills, it was agreed that these reports should be received. The report of Council since the adjournment came up for adoption subsequently.

The President said that only one nomination had been received



THE P.P.A. CONGRESS.—KEY TO THE GROUP REPRODUCED IN THE "BRITISH JOURNAL OF PHOTOGRAPHY," OF SEPTEMBER 22.

1. Mrs. F. Brown, Leicester.
2. Mrs. Maud Basil, London.
3. Mrs. Gordon Chase, Bromley.
4. Mrs. Speight, Nuneaton.
5. Mrs. J. C. Harper, Leith.
6. Miss Illingworth, Northampton.
7. F. Read, Liverpool.
8. A. H. Ll. Chapman, Swansea.
9. W. Illingworth, Northampton.
10. George Hana, London.
11. Frank Brown, Leicester.
12. Pirie Macdonald, New York.
13. Mrs. Swan Watson, Edinburgh.
14. A. Swan Watson, Edinburgh.
15. Alfred Ellis, London.
16. A. Corbett, London.
17. R. N. Speaight, London.
18. Gordon Chase, Bromley.
19. F. Wakefield, Chiswick.
20. W. Wedlake, London.
21. T. Chidley, Chester.
22. W. E. Gray, Bayswater.
23. Mrs. W. E. Gray, Bayswater.
24. C. F. Dickinson, Dulwich.
25. Mrs. C. F. Dickinson, Dulwich.
26. Mrs. Herbert Morle, Perth.
27. E. J. Short, Nottingham.
28. G. J. Hughes, Bridge of Allan.
29. A. Clara Cooper, Birmingham.
30. H. J. Whitlock, Birmingham.
31. N. G. Devare, Bombay.
32. R. L. Speaight.
33. H. Harrison, Bow.
34. E. A. Harrison, Bow.
35. A. Eddison, Barnsley.
36. Mr. Durant, Barnsley.
37. Clare Speight, Nuneaton.
38. J. W. Stocks, Uppingham.
39. Oscar Owers, Southsea.
40. W. H. Duncan, Hull.
41. Mrs. W. H. Duncan, Hull.
42. James Maclachlan, Wishaw.
43. James Nimmo, Ayr.
44. Mrs. James Nimmo, Ayr.
45. Mrs. Wakeling.
46. A. W. Wakeling.
47. Mrs. F. Wakefield, Chiswick.
48. Mrs. W. Wedlake, London.
49. Mrs. Vanderbilt, Liverpool.
50. J. R. Saronie, Liverpool.
51. Mrs. J. R. Saronie, Liverpool.
52. H. Bentley, Barrow-in-Furness.
53. Mrs. H. Bentley, Barrow-in-Furness.
54. S. W. Pritchard, Lochee, Dundee.
54A. W. B. Chaplin, Windsor.
55. L. Croad, Southsea.
56. T. W. Clark, Forest Gate.
57. Mrs. H. Evans, Plaistow.
58. Mrs. Shotter, Plaistow.
59. J. C. Brown, Falkirk.
60. J. Campbell Harper, Leith.
61. Mrs. Haines, East Sheen.
62. Miss Brown, Inverurie.
63. T. R. Hammond, Conway.
64. E. E. Carter, Romford.
65. W. Edwards, Romford.
66. C. S. Harris, Dover.
67. A. O. Forrest, Pontypridd.
68. L. Ladd, Tonypandy.
69. Dan Osborne, Treharris, S. Wales.
70. Chas. Hopp, Detroit, U.S.A.
71. J. D. Chambers, Newark.
72. Mrs. J. D. Chambers, Newark.
73. C. Wilson, Lowestoft.
74. J. Dickinson, Newcastle-on-Tyne.
75. E. J. F. Leatherby, Plymouth.
76. T. P. Cummings, Warrington.
77. R. H. Gresswell, Southport.
78. W. H. Huish, Manchester.
79. J. Edwards, Oldham.
80. Lang Sims, Brixton.
81. Archer Clarke, London.
82. E. G. Shapper, Barking.
83. A. M. Scott, Kodak, Ltd.
84. J. L. Newman, Kodak, Ltd
85. W. H. Brown, Weston-super-Mare.
86. E. J. Edwards, Birmingham.
87. H. Trevor Jessop, Exmouth.
88. Mrs. H. Trevor Jessop, Exmouth.
89. Wilfred, Jenkins, South Kensington.
90. G. B. Towner, Uckfield.
91. G. H. Wakefield, Hanwell.
92. H. Hall, Wakefield.
93. W. E. Bull, Witham, Essex.
94. Alfred Houper, Watford.
95. T. Lee Syms, Tyldesley.
96. G. Cowley, London.
97. Mrs. G. Cowley, London.
98. D. Garner, Stockport.
99. Mrs. D. Garner, Stockport.
100. T. A. Scotton, Derby.
101. Miss Methwen-Brownlee.
102. G. J Heaton, London.
103. Miss S. Weston, Northwood.
104. Miss Daisy Day, Bishop's Stortford.
105. Miss Alicia Wicks, London.
106. J. Charlton, Canterbury.
107. H. Lawrence, Kodak, Ltd.
108. A. G. Webb, Kodak, Ltd.
109. G. N. Futcher, Southsea.
110. R. M. Watt, Dundee.
111. W. H. Thomas, Melbourne, Australia.
112. E. V. Bowles, Dover.
113. Mrs. E. V. Bowles, Dover.
114. J. S. Simnett, Burton-on-Trent.
115. Archer Argent, Kensington.
116. F. W. Vidler, Willesden.
117. A. Handford, Croydon.
118. A. W. Dron, Brondesbury.
119. A. J. Anderson, Leighton Buzzard.
120. W. Longman, Cheltenham.
121. E. C. Moxon, Folkestone.
122. Mrs. Butt, Bourton-on-the Water.
123. W. J. Butt, Bourton-on-the Water.
124. S. A. Chandler, Exeter.
125. A. Bennett, London.
126. T. E. Notcutt, Plymouth.
127. W. Wade, Middlesbrough.
128. J. Bamber, Blackpool.
129. C. S. Downing, Elstree, Herts.
130. A. F. Loveday, London.
131. E. F. Gilbert, London.
132. Jack Thomas, Swansea.
133. Norman Bunting, South Bank, Yorks.
134. E. Milner, London.

Photographic copies of the group are obtainable from Mr. W. B. Chaplin (J. Russell & Sons), Windsor.

for the presidency—namely, Mr. Alexander Corbett—and, therefore, no ballot would be necessary, and it only remained for the meeting to signify its approval of the choice.

The meeting did so by acclamation, and Mr. Corbett expressed his thanks for the honour done him.

The President said that Mr. R. N. Speaight was the only nomination for the treasurership, and he asked the meeting to approve his election. (Loud applause.)

Mr. Speaight thanked the members.

The President said that there were only four nominations for the four vacancies for London members of the Council—namely, Messrs. A. Basil, R. Haines, G. Hana, and Lang Sims—and, therefore, no ballot would be necessary. For the vacancies for four country members there were six nominations—namely, Mr. F. Brown (who now terminated his *ex officio* membership of the Council as Past President), Mr. W. B. Chaplin, Mr. G. N. Futcher, Mr. F. Read, Mr. H. C. Spink, and Mr. W. H. Wedlake. A ballot would, therefore, be necessary.

Mr. Wilson and Miss Brownlee were appointed scrutineers.

The ballot having been taken, the President declared the following had been elected:—Messrs. F. Brown, W. B. Chaplin, H. C. Spink, W. H. Wedlake.

Mr. Archer Clarke then proposed that Messrs. Norton, Slade & Co. be reappointed auditors at the usual fee of ten guineas, and Mr. N. G. Devare (Bombay) seconded.

Mr. F. W. Vidler said that ten guineas was a large fee in view of the comparative smallness of the Association and the simplicity of its finance.

The President said that his own experience was that this was quite economical auditing.

Mr. Speaight pointed out that the Association was a newly-started company, necessitating quite a considerable scheme of book-keeping, and the accounts for the "Record" were a complicating factor. He personally thought the amount an extremely reasonable one for the work entailed.

Mr. W. H. Huish also thought the sum a very modest one.

Mr. Speaight added that financially the Congress was likely to prove better than any of them had anticipated. On the Council they would not have thought it extravagant if they had had to dip into their reserves to meet the expenditure on what was a magnificent advertisement, but it seemed likely that the balance would be on the right side.

The motion reappointing the auditors was then agreed to without dissent.

Mr. A. Barrett then moved the adoption of the report of the Council since the adjournment of the Annual General Meeting of March 10, and drew attention to the fact that very little mention had been made in the report about the Exhibition, and this only showed how modest the members of Council were with regard to their own labour and achievements.

Mr. Wilson seconded, remarking that the work of the Council had been the work of giants.

The motion was agreed to unanimously.

On "Other Business,"

Mr. W. H. Huish apologised for certain Lancashire friends who had been obliged to leave London before the termination of the Congress. A territorial Association had been formed in the North of England four years ago, and was a very live body, but he desired to make it plain that its supporters were equally loyal members of the national association. On the other hand, these local or territorial associations did an enormous amount of good in their areas, and he thought their formation should be encouraged throughout the country. This would save the trouble and expense of devolution. Up to now the Association in London had been able to carry on in a very quiet and unassuming way, but in the years to come it might find such territorial associations affiliated to its own body of very great value and support. He wanted to know how such associations were affiliated, and whether they paid a fee, and whether they had direct representation on the Council. The society for which he spoke was quite prepared to consider the question of an affiliation fee. It did not want merely to think of itself as affiliated; it wanted to be a definite part of the Association. If it paid its quota it should have representation on the Council. On another occasion he trusted the President might give some enlightenment on this subject.

The Secretary said that at the present time the Council had not gone sufficiently far into the matter to ask for or accept any affiliation fee from the societies. Any help which could be given on matters which concerned the whole of the members, the Association was only too pleased to give, expecting in return that should it have any trouble in a particular locality covered by one of these bodies similar help would be given there. It was his desire to form a society in every county in the kingdom, and he hoped he might be spared long enough to carry that through. Originally the idea was to have branches in every town, but local rivalries were an impediment; this would not hold good in the larger area of a county.

Mr. A. Barrett moved:

> That this meeting express its deep appreciation of the painstaking work accomplished by the officers and members of Council of this Association during the year; also that this meeting place on record its indebtedness for the hard work that has been done by all concerned to make the great International Exhibition such a tremendous success.

He drew attention to the excellencies of the Exhibition and the Congress, and also to the great publicity which it had received. "The Times" and other papers had been very generous in their notices, and the provincial Press had also done its share. The publicity secured was a testimony to the efforts of the Council.

Mr. Oscar Owers seconded. The private members of the Association had only a vague idea of the tremendous amount of work put in by the officers and Council, but they appreciated it exceedingly. He wished to say how very gratefully he valued the high, idealistic, almost religious tone of some of the events of the Congress. Everything arranged for that week had been of the very first order.

Mr. W. H. Huish, on behalf of Lancashire, wished to associate himself with this vote. He looked upon the Exhibition and Congress as a most wonderful achievement. The Council was to be highly congratulated all the way through. The outing on the previous day had been one of the happiest he had ever enjoyed. There was only one point of smallest criticism. He hoped that another year the Annual Meeting and dinner would not be relegated to the last day, by which time some of the members had had to leave.

Mr. A. C. Forrest, as a humble representative from the gallant Principality, added his appreciation of the work so well and thoroughly done. When he read of the long hours of the Council meetings he was lost in astonishment to think that so many men could be found to come together and give so much valuable time.

Mr. J. Nimmo said that those from Scotland endorsed all that had been said. The Scot was seldom exuberant in his appreciation, but he felt it all the same.

The motion was then put to the meeting by Mr. Barrett, and adopted with loud applause.

The President said that in the course of their lives most of them had done many things for which they had received no reward, but this was altogether the other way.

In reply to a member who asked whether it was not possible to have the Congress earlier in the year, the President said that all other possibilities had been explored by the Council, and that the galleries could only have been secured conveniently in September, which, although inconvenient to some, was convenient for many members.

Mr. Marcus Adams suggested that next year the Congress should be held in Edinburgh, while Mr. A. L. Chapman put in a word for South Wales. Mr. Speaight said that he feared these suggestions were not practical. The Congress next year, which would be a bigger one than this, would involve a great number of committee meetings, etc., which could not be worked outside London. It was not a case of a mere Convention, but of a very large Exhibition, involving a great amount of local labour.

This concluded the business of the meeting.

THE ANNUAL DINNER.

The 21st anniversary dinner, which took place at Prince's Restaurant on the Friday evening, was a very happy "wind-up" of the Congress. It had a distinct Scottish flavour, alike in the decoration of the tables and the presence of a Highlander, who perambulated them with the pipes. Mr. A. Swan Watson presided, and the principal toast, that of the Association itself, was proposed by Mr. W. L. F. Wastell, President of the Royal Photographic Society. All the speeches were brief, Mr. Wastell's quite disappointingly so, but, as he declared, there was no need to dilate upon the value of the Association or the reasons for wishing it success and prosperity.

Mr. Swan Watson said that the Congress had been the largest

and most influential the Association had ever organised. He had not the slightest idea until he actually got to London that the exhibition was on so large and important a scale. He added that the Congress was made still more memorable by the presence of visitors from the United States, Canada, Australia, India, and Sweden. The past year had been marked by great activity in the Association, especially by the incorporation and by the establishment of the "Record," and there were many other activities ahead.

Mr. R. N. Speaight proposed the "Health of the Visitors," whom he preferred to call the friends. He read telegrams from "Annie and Jack Kennedy" and "The Ayletts," who had had to leave to catch their boat for Canada, both conveying much appreciation for kindness shown them during their stay.

Mr. Pirie MacDonald aroused laughter by giving his speech in the style of a military report, to the effect that the Canadians had withdrawn under the heavy fire of British hospitality, and, as for himself, he was compelled to retreat in the morning, and within 24 hours his vessel would have her nose pointed for Sandy Hook. There was one fly in the amber. The man most responsible for the fellowship between British and American photographers—Reggie Haines—was ill in bed. He called upon the gathering to stand and drink the health of Mr. Reginald Haines, which they did with a very good will. Mr. Macdonald concluded his speech by saying that the Americans were the greatest people in the whole world for using "pep"; the English had it, but they did not use it. He called on the company to repeat after him, "I want what I want when I want it," and this was done, with many resounding bangs on the table.

Mr. Brooke, formerly of Sydney, also replied to the toast. He was sorry to see that Australia was not represented in the exhibition, and would endeavour to repair the omission on a future occasion after his return. He was, however, enjoying a brief (!) holiday, and would not be resuming work until January 1, 1924.

The President at this point read a telegram from Mr. Flodin, of Stockholm, "Three cheers for the P.P.A."

Mr. F. G. Wakefield took occasion to thank the trade exhibitors for their support, and with him gratitude was an expectation of favours to come; next year the trade exhibit would have to be on a much larger scale.

Mr. R. E. Carter acknowledged the compliment, and said that the exhibitors were grateful for the untiring efforts of the Council and for the support of the members.

Mr. Marcus Adams proposed the toast of "The Press." The Press was one of the best friends of the Association. During the Congress something like 50 notices had appeared in the daily journals. When the Association developed its co-operative advertising scheme the Press would be more than ever their great standby. He thanked the photographic Press in particular for its support, mentioning Mr. T. Bell, editor of the "Professional Photographer"; Mr. Child Bayley and Mr. F. J. Mortimer, editors of the "Amateur Photographer and Photography"; Mr. G. E. Brown, editor of the "British Journal of Photography"; and, of course, Mr. Jenkyns Griffiths, editor of their own "Record."

Mr. Child Bayley, in response, said that the P.P.A. was particularly associated with amateur photography, because the Association incorporated the successful professional photographers, and these were essentially men who had the amateur spirit—that is to say, they loved their art, and the fact that it was their livelihood was a subsidiary matter. He also mentioned that the highest award in the British section of the Exhibition was taken by two ladies who were certainly amateurs, whether professionals or not. He recalled that on a previous occasion he alone had had to answer for the Photographic Press, because Mr. G. E. Brown was in ill-health. They were glad to see Mr. Brown back among them on that occasion. (Applause.)

Mr. G. E. Brown said that the gentleman who ought to reply to this toast was Mr. Griffiths, the Association's own editor, who had a rotten job. (Laughter.) There were two honorary editors, whose job was also rotten, and poor Mr. Griffiths had not only to please these two honorary editors, but the several members of the Council. If he might offer advice he would suggest that this editorial system was impossible, and that Mr. Griffiths ought to have the entire responsibility. The whole Photographic Press welcomed the appearance of the "Record" and wished it every success. The Photographic Press also rejoiced in the success of the Congress. The Council had wrestled with difficulties that might have seemed insuperable and had brought off a good thing.

Mr. Arthur Webb proposed the toast of the "Officers and Council," who deserved the gratitude, he said, of the general body of members. Mr. Angus Basil suitably replied in a few sentences, and said that next year big schemes had been suggested to them, and they would have to call upon more outside help.

Mr. Frank Brown proposed the "Health of the President." They had learned not only to respect Mr. Swan Watson, but to love him. His kindness had shone throughout the week, and he carried with him into retirement the best wishes of them all. (Loud applause.)

Mr. Swan Watson said that his year of office had been one of great enjoyment, thanks to the courtesy shown by his colleagues. He regretted that one of the members of the Council to whose unfailing optimism they all owed much—Mr. Reginald Haines—was away ill. Mr. Haines had sent a very nice letter, one sentence of which ran: "I stated at Buffalo last year that the members of the Convention visiting our Congress would meet with a great reception, and I wish to thank all our members, and especially my colleagues in the Council, for so loyally 'waking up' to this Congress." The President also read a telegram of greeting from the Photographic Society of Stockholm, and a telegram from Mr. Luboshey, "Kindest greetings to brother photographers. They should not be at daggers drawn."

The President then invested his successor, Mr. Alexander Corbett, with the badge of office, amid loud applause, and Mr. Corbett, in return, invested Mr. Swan Watson with the ex-President's badge.

Mr. Corbett said that he had a very difficult task indeed to follow the tradition set by Mr. Watson. Next year the Association looked forward to still greater things, and he hoped the manufacturers and dealers would give them still more support. The time had come when the manufacturers and dealers and themselves might meet at a round-table conference once or twice a year. He ended by proposing the health of Mr. Alfred Ellis—the man behind the gun. (Applause.)

Mr. Alfred Ellis said that he was only resuming a position which he first occupied when the Association was started 21 years ago. It was never his wish to leave that position, but he was made President, and could not fill the two offices. His best endeavours would be to promote the interests of the Association, and he hoped to see many hundreds, if not thousands, of new members. (Applause.)

During the evening a very fine musical programme was carried out under the direction of Mr. Herbert Lambert and the Secretary. Musical items were rendered by Miss Hebe Simpson, Mr. Lloyd Huwe, Mr. Ranger, and Miss Dorothy Glover's Trio (Miss Glover, Miss Elsie Barnard and Miss Maud Lucas). It was well after eleven before the company rose.

R.P.S. EXHIBITION LECTURES.

THE following lantern lectures will be delivered during the annual exhibition of the Royal Photographic Society, which will be open until Saturday, October 28:—

Friday, September 29.—Exhibition Lantern Slide Night. The slides selected for the exhibition will be shown on the screen.

Tuesday, October 3.—Lantern Lecture. "Lourdes." T. H. B. Scott, F.R.P.S.

Friday, October 6.—Lantern Lecture. "The Beginnings of London." Frank Lambert, M.A., F.S.A.

Tuesday, October 10.—The Twenty-fifth Annual Traill-Taylor Memorial Lecture: "The Development of the Photographic Lens from the Historical Point of View." Dr. Reginald S. Clay.

Friday, October 13.—Lantern Lecture. "Carcassone and the Pyrenees." Dr. C. Atkin Swan.

Tuesday, October 17.—Lantern Lecture. "The Progress of Aerial Photography." Major F. C. V. Laws.

Friday, October 20.—Lantern Lecture. "Recent Work in Cloud Photography." G. Aubourne Clarke.

Tuesday, October 24.—Lantern Lecture. "Some Landmarks of Ancient Egypt." E. W. Mellor, J.P.

Friday, October 27.—Lantern Lecture. "Familiar Flowers in Monochrome." Dr. G. H. Rodman.

COLOUR BY DEVELOPMENT IN LANTERN SLIDE MAKING.

Two sets of lantern slides, illustrating the factors governing colour, when using a developer containing a solvent of silver halide, and the influence of thiocarbamide in the developer, are shown at the Exhibition of the Royal Photographic Society, by Mr. J. Dudley Johnston. The greatest interest attaches to this exhibit, as some interesting tones are shown, and the developer is an improvement upon one suggested in the first edition of a booklet upon lantern slide making published by Messrs. Wratten & Wainwright. While some of the colours will not be admired, others cannot fail to please, and with the details of the experiments before him, the slide maker should be able to obtain some fine results. We have examined the slides carefully, and have given a name to the colour of each, as it appears to us. It is rather unfortunate that the slides are placed so close together, especially as the difference in colour of some of them is so slight, but by covering up the slides nearest to the one under examination a good idea of its actual effect was obtained. To our mind the best slide in the two sets is No 1. series 7a. This is in a beautiful warm chocolate colour very luminous and of excellent density, eminently suiting the sea and mountain subject. Another good slide is No. 1. Series 6, which is also a warm chocolate brown. We quote the full particulars of the process, and Mr. J. Dudley Johnston's remarks for obtaining these slides from the Exhibition Catalogue of the Royal Photographic Society, with the addition of the colour table added by ourselves. We have also noted the slide we consider the best in each series.

Exhibit No. 686 represents a set of 30 slides illustrating the factors governing colour in lantern slides when using a developer containing a solvent of silver halide. This exhibit is designed to show the influence of the different factors—exposure, temperature and developer—on the colour of the slide, and is arranged in 6 series of 5 slides each. The middle slide of each series, viz., No. 3, represents the normal, and each of these six slides received the same exposure, and was developed with the same developer at the same temperature. The results should therefore be identical. They show, however, some slight differences due to having been developed to different densities. This is due to the fact that development has to be gauged by appearance, as Mr. Johnstone has been unable to evolve any factorial system that would ensure uniformity owing to this developer being so extremely sensitive to slight variations of temperature and to other conditions (possibly the electrical state of the atmosphere) which are at present obscure. No doubt varying conditions of the electrical supply may be one of the contributory causes to a lack of uniformity.

The first task was to determine the correct exposure for the normal slide (No. 3 of each series) when using the developer designated X at the middle temperature, viz., 70°. This exposure is expressed as 1. In the case of these experiments, it was, as a matter of fact, 30 seconds at three feet from an Edwan Fullolite 90-watt lamp at a nominal voltage of 210.

The developers were made up from three solutions A, B, and C, as follows:

FORMULÆ.

A.—Metol		44 grs.
Hydroquinone		30 grs.
Soda sulphite anhydrous		240 grs.
Soda carbonate anhydrous		300 grs.
Water		20 grs.
B.—Ammonium carbonate		1 oz.
Ammonium bromide		1 oz.
Water		20 ozs.
C.—Thiocarbamide		33 grs.
Ammonium bromide		11 grs.
Water		10 ozs.

Five different combinations were then made up for use.

Developer T consisted of	6 parts A,	1 part B,	1 part C.
W	6	1	1
X	6	1½	1
Y	6	2	1
Z	6	2½	1

Series 1 shows the effect of Temperature alone.
2 " " Exposure alone.
3 " " Developer alone.
4 " " Temperature and Developer varied inversely.
5 " " Temperature and Exposure varied inversely.
6 " " Exposure and Developer varied inversely.

No attempt was made to obtain exact compensation between the factors in Series 4, 5 and 6. The effects shown are those of purely arbitrary ratios to cover a wide range of possibilities.

Series 6 comes nearest to showing what happens in actual practice when making lantern slides by this process.

DETAILS OF THE EXPERIMENTS.

Slide.	Exposure.	Developer.	Temperature. Degs.	First appearance of image. Secs.	Development completed. Mins.	Colours.
Series 1.						
1	1	X	60	90	10	Blue grey, weak, slightly flat.
2	1	X	65	90	8	Warm gray, more luminous than No. 1.
3	1	X	70	75	6½	Warm grey, good density.
4	1	X	75	50	5½	Colder and weaker than 3.
5	1	X	80	35	4	Warm grey, warmer than 3, best slide in Series 1.
Series 2.						
1	½	X	70	60	7½	Yellowish grey.
2	½	X	70	60	7½	Cold grey.
3	1	X	70	60	6½	Colder and weaker than 2.
4	2	X	70	60	6½	Greenish blue, good depth, best slide in Series 2.
5	4	X	70	60	6	Violet grey, slightly flat and muddy.
Series 3.						
1	1	T	70	20	11½	Purple brown, good depth, shadows rather heavy.
2	1	W	70	45	4½	Greenish blue (cold), good depth.
3	1	X	70	60	6½	Warm blue black, slightly heavy.
4	1	Y	70	75	7	Brownish violet.
5	1	Z	70	75	8	Warm black, best slide in Series 3.
Series 4.						
1	1	T	50	150	25	Warm brown, slightly uneven density.
2	1	W	60	90	8	Warm black, heavy shadows.
3	1	X	70	60	6½	Grey, weak density, as 3, Series 2.
4	1	Y	80	45	5½	Colder and weaker than 3.
5	1	Z	90	30	3	Brown to chocolate, best slide in Series 4.
Series 5.						
1	½	X	80	30	3½	Warm grey, very luminous.
2	½	X	75	75	7	Warm grey, warmer than 1, yellowish high light.
3	1	X	70	75	7½	Cold grey.
4	1½	X	65	105	9	Cold greenish grey.
5	2	X	60	135	11	Greenish grey, deeper than 4, best slide in Series 5.
Series 6.						
1	½	T	70	35	4	Warm chocolate brown, fine luminous slide, best in set.
2	½	W	70	50	4½	Cold grey, washed out.
3	1	X	70	60	6	Blue grey, darker than 2.
4	2	Y	70	70	7	Purple brown, heavy shadows slightly clogged.
5	4	Z	70	90	10	Warm purple, luminous.

Exhibit No. 687 represents a set of 10 slides illustrating the influence of the proportion of thiocarbamide in the developer upon the colour of lantern slides.

These slides are to be considered as a pendant to Set No. 686, and again the third slide of each series represents the normal as explained above.

Thiocarbamide is a solvent of the silver halide of the plate and, further, has a powerful retarding influence on development. The practical effect would appear to be that where the proportion of Solution C exceeds the normal, the increased solvent action operating during the more prolonged development produces a flat over-exposed effect, and it is difficult to secure full density. On the other hand, with a proportion of Solution C below normal, the more rapid development secures full density before the solvent action has had time to operate fully. The

application suggested is that, with a thin negative, the proportion of Solution C should be decreased, and with a contrasty negative be slightly increased to secure the best results.

Series 7 shows effect of varying both the exposure and proportion of Solution C. Series 7A, of varying proportion of Solution C only, the other factors remaining constant.

The deduction from these is that thiocarbamide, although retarding development, is not a restrainer in the photographic sense, and does not tend to increase contrast.

DETAILS OF THE EXPERIMENTS.

Slide.	Exposure.	Developer.			Temp. Deg.	First appearance of the image. Secs.	Development complete. Mins.	Colours.
Series 7. No.		Sol. A. Parts.	Sol. B. Parts.	Sol. C. Part.				
1	¼	6	1½	½	70	30	4	Warm brown, fine and luminous.
2	½	6	1½	⅓	70	40	4	Yellowish brown.
3	1	6	1½	½	70	60	6	Cold purple brown.
4	2	6	1½	⅔	70	80	7½	Purple grey, uneven density.
5	4	6	2½	⅚	70	120	13	Yellowish purple, weak and washed out.
Series 7A.								
1	1	6	1½	⅙	70	20	2	Warm chocolate, best slide in this set.
2	1	6	1½	⅓	70	25	2½	Chocolate, slightly colder than 1.
3	1	6	1½	½	70	45	4½	Purplish green, uneven density, flat.
4	1	6	1½	⅔	70	65	6½	Warm purple, uneven density.
5	1	6	1½	⅚	70	85	8½	Weak yellowish brown, uneven density.

Attention is directed to No. 5 of Series 7. It was obvious when developing No. 4 of that series that the exposure given to No 5 would be far too much for the developer being used, and the result would be useless. The proportion of Solution B was, therefore, increased to 2½ parts with a view to counteract the excessive exposure. This, by prolonging development, probably did more harm than good.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, OCTOBER 2.

Bradford Phot. Soc. Social and Musical Evening.
Southampton C.C. "In Pictureland With a Camera." Rev. W. Hogan.

TUESDAY, OCTOBER 3.

Exeter Camera Club. Presidential address delivered by Dr. C. Beauchamp-Hall, F.R.C.S.
Hackney Phot. Soc. "In and Around Quaint Holland." E. T. Coombes.
Manchester Amateur Phot. Soc. Exhibition of Prints, by Fred Judge.

THURSDAY, OCTOBER 5.

Hammersmith Hampshire House Phot. Soc. "Chinese and Indian Hard Stone Carvings." Cecil Thomas.
Rochdale Amateur Phot. Soc. Annual General Meeting.
The Royal Photographic Society. "The Use and Misuse of Short Focus Lenses. R. H. Lawton, F.R.P.S.

SATURDAY, OCTOBER 7.

Edge Hill Camera Club. Outing to Ormskirk and District.

CROYDON CAMERA CLUB.

The informal session, rapidly drawing to a close, once again indicated its versatility last week, when Mr. A. H. Tarry demonstrated "Casting Flowers in Metal," one of the most wonderful working expositions ever given in the club-rooms.

A loganberry leaf was taken, and within an hour or so a perfect cast in aluminium was produced, faithful even to minute hairs.

Briefly, the procedure is as follows:—The flower, leaf, butterfly, or other natural object is coated with shellac solution, and then painted round with an investment material capable of withstanding intense heat. The mould is then heated to carbonise the encased object, debris being removed by washing with mercury. Finally, the metal is melted by blowpipe or oxy-hydrogen jet, and forced into the mould under heavy pressure

Exquisite specimens, many seemingly impossible to cast, were passed round, including some in gold, which, it may proudly be recorded, were all returned. In reply to a question, the lecturer said it would be quite feasible to cast a spider's web, provided the strands were strong enough to withstand the preliminary treatment. A suggestion by a member that the chairman, Mr. Rose, should be cast in metal as a permanent adornment for the club-rooms was modestly negatived by this flower of the flock.

A most hearty vote of thanks was accorded Mr. Tarry, who, in replying, observed that a number of hospitable friends had pressed him to take a drink, but nothing had materialised. Luckily, the rational hour permitted this serious omission to be rectified.

Commercial & Legal Intelligence.

NEW COMPANIES.

PARADE DRUG STORES, LTD.—This private company was registered on September 16 with a capital of £1,000 in £1 shares. Objects: To carry on the business of dealers in photographic goods and materials, opticians, etc. The first directors are: W. A. King, 58, Cazenove Road, N.16, tobacconist; E. J. Reedman, 9, Green Lanes, N.16, pharmaceutical chemist (managing director). Qualification, one share. Remuneration, £500 divided between them. Registered office: 9, Green Lanes, Stoke Newington, N.16.

NATIONAL TRADE MONOTYPERS, LTD.—This private company was registered on September 16, with a capital of £2,500 in £1 shares. Objects: To adopt an agreement with J. W. Lawson, and to carry on the business of printers, stationers, mechanical typesetters, lithographers, type founders, stereotypers, electrotypers, photographic printers, etc. The first directors are: W. Tomlin, 15, Waterloo Road, Barnsley, printers' manager; J. W. Lawson, 14, Russell Street, York, printers' manager. Qualification, £100 sharse. Secretary, J. W. Lawson. Registered office: 8-10, Wyre Street, Ardwick, Manchester.

GRAYS PUBLISHING CO., LTD.—This private company was registered on September 14 with a capital of £12,000 in £1 shares (6,000 preference). Objects: To take over the business of printers, publishers, photographers, producers and vendors of picture postcards, guide books and letter cards carried on at 13, Gray's Inn Road, W.C., as "Grays Publishing Co." The subscribers (each with one share) are: Mrs. A. M. Barley, Leutchine, Burlington Road, Swanage; Pindo Ajelli, 13, Gray's Inn Road, W.C.1, fine art publisher. The subscribers are to appoint the first directors. Qualification: £100. Remuneration as fixed by the company.

YEVONDE, LTD.—This private company was registered on September 12, with a capital of £2,000 in £1 shares. Objects: To take over from F. H. Swoffer, or his trustee, the business of a photographer, carried on at 10, St. Ann's Square, Manchester, and to acquire from Yevonde Middleton, of Victoria Street, Westminster, the non-exclusive use of the name "Yevonde" used by her in connection with her photographic business, with a view of carrying on the businesses so to be acquired as "Yevonde, Ltd.," to adopt agreements (1) with H. Sharp and the said F. H. Swoffer and (2) with the said Yevonde Middleton. The first directors are: Muriel Oliver, The Waterhouse, Bollington (chairman); Yevonde Middleton, Victoria Street, Westminster. Remuneration of Muriel Oliver, £250 for first year and £300 for each subsequent year; of the said Yevonde Middleton, £150 per annum. Qualification of Muriel Oliver as chairman, 500 shares; of Yevonde Middleton, 250 shares.

THE CLUB PHOTOGRAPHER.—The October issue of the "Club Photographer" contains articles by members of the Preston Camera Club, amongst them one on the "Paget Colour Process" and another on "Nature Photography."

News and Notes.

BRIFCO, LIMITED.—The registered office of this company is now at Trafalgar House, 11, Waterloo Place, London, S.W.1, to which new address all communications relating to the company's business should be sent. The company's new telephone number is Regent 3227.

COLLOID CHEMISTRY.—The "Fourth Report on Colloid Chemistry," arranged by the Department of Scientific and Industrial Research, has just been published. It deals in a very exhaustive manner with the various applications of colloid chemistry to manufacturing processes, and will be of great value to works chemists. Copies of the Report may be obtained from H.M. Stationery Office, Imperial House, Kingsway, W.C.2, or 37, Peter Street, Manchester, price 5s. 6d. net.

LAFAYETTE, LTD.—The staff of this well-known establishment, to the number of fifty persons, held their annual excursion to Westcliff-on-Sea on Saturday, September 23. After exploring the delights of the town, dinner was served at the "Acorn" under the chairmanship of Mr. Lundie, supported by Misses Rearden and White. A vote of thanks was carried with acclamation to Mr. Jas. Lander for granting the holiday and financially helping towards its success. Bathing at Canvey Island and visits to the Kursaal added to the pleasure of the outing, and a concert and dance closed a successful day.

METRIC EQUIVALENT AND MENSURATION SCALES.—A series of sixteen tables produced by photographic methods and printed in pocket folder form is being supplied by Mr. A. E. Bawtree. This comprises a handy and convenient method of calculation which should be of use to photographers, scientists and students. The scales are plainly printed, and include weights, measures, temperature tables, etc. The process by which these scales are prepared is illustrated at the R.P.S. Exhibition in frame No. 268, where details of the process are given. The price of the folder is 1s., post free, from Mr. A. E. Bawtree, 7, Manor Park Road, Sutton, Surrey.

PHOTOGRAPHY IN THE HOME is the title of a very instructive little booklet now being issued by Messrs. W. Butcher and Sons, Ltd., Camera House, Farringdon Avenue, E.C.4. Twenty pages of information and suggestions for winter camera work, by Harold J. Grainger, precede a catalogue of enlargers, flashlamps, mounts, etc., and make the book of especial value to the camera worker during the winter months. The booklet is supplied to dealers at a low price, viz., 100 for 5s., 250 for 7s. 6d., 500 for 12s. 6d., and 1,000 for 20s., these prices including the imprinting of the dealer's name and address and the supply of a useful window slip.

R.P.S. EXHIBITION.—The October issue of the "Photographic Journal," the official organ of the Royal Photographic Society, will be a special exhibition number, and will contain a large number of reproductions of photographs included in the Society's sixty-seventh exhibition, now open at 35, Russell Square. In addition, the various sections of the exhibition will be reviewed by well-known authorities, so that the issue will form an interesting and instructive record of the exhibition. It is to appear to-day, September 29, and copies may be obtained from the Secretary, Royal Photographic Society, 35, Russell Square, W.C.1, price 1s. 8d. each, postage included.

NORTH YORKSHIRE AND SOUTH DURHAM PROFESSIONAL PHOTOGRAPHERS' SOCIETY.—The fourth meeting was held on Tuesday, the 19th inst., in the studio of Messrs. A. E. Ball & Son, Stockton-on-Tees, when the members were given a very interesting demonstration by Mr. Wesson, of Wellington & Ward, Ltd., of Wellington B.B. paper. The able way in which the demonstrator dealt with his subject made the lecture all the more interesting, and the development and toning of the various prints which he made were followed with keen interest by all present. At the close of the lecture light refreshments were provided, and very hearty votes of thanks were passed to Mr. Wesson, and also to Messrs. Wellington & Ward.

COLOUR CINEMATOGRAPHY.—The "Times" New York correspondent reports that a process of colour cinematography, the result of seven years' work by an American scientist, Mr. Daniel Comstock, is announced by Mr. William Travers Jerome, the New York lawyer, who has organised a company of New York business men and cinema producers to exploit the discovery. The great virtue claimed for his invention by Mr. Comstock, apart from its perfection in colour rendering, is its cheapness. The film is photographed in the ordinary manner, but with a special camera. After development, it is run through several chemical baths, which produce the required tints. The cost of colouring is stated to be negligible. Mr. Comstock is, of course, well known as a patentee of processes and apparatus for colour photography.

PROFESSIONAL PHOTOGRAPHS IN GLASGOW.—Special attention may be directed to the exhibition of professional photographic portraiture, which has been arranged by the Glasgow and West of Scotland Society of Professional Photographers, and will be opened on Monday, October 2, at the McLellan Galleries, Glasgow, by the Lord Provost. We believe this is the first occasion on which an exhibition solely of professional photographs has been held in Scotland under auspices which will attract a large attendance on the part of the public. Admission to the exhibition is free, and during the period of the exhibition lectures will be given by Mr. C. P. Crowther and others. We wish our Scottish friends well in this piece of enterprise undertaken with the object of enlisting the interest of the public in the commercial capital of their country.

BUTCHER'S WINTER CATALOGUE.—This interesting booklet has reached us from Messrs. W. Butcher and Sons, Ltd., Camera House, Farringdon Avenue, E.C.4. It contains particulars of many lines, particularly suitable to the winter trade. Amongst these we may mention the "Club" and the "Home" lanterns, both of which are built on unique lines. The "Dualite" enlargers for use without condensers are novel in design and practical in making. The "Empire" series of home cinematographs will appeal to many amateur film makers during the winter months, and for these workers, film printers and developing frames are also supplied. The Christmas trade is provided for in passe-partout calendars and greeting cards, and also the well-known series of Primus engineering sets. As Messrs. Butcher's say, this booklet is truly a "winter encyclopedia" and we recommend our dealer friends to obtain a copy.

AWARDS AT GLASGOW.—In the Photographic Section of the Housing and Health Exhibition which opens in Kelvin Hall, Glasgow, on October 2, the trophy offered for the best print in the exhibition was awarded to John Baird. The following awards have also been made. Class 1: 1st, John Baird; 2nd, Louis J. Steele; 3rd, A. T. Edgeley. Class 2: 1st, Mesdames Morter; 2nd, G. Hill; 3rd, S. Langfier. Class 3: 1st, Dan Dunlop; 2nd, Mesdames Morter; 3rd, H. G. Ballance. Class 4: 1st, John Williamson; 2nd, A. L. Hitchin; 3rd, H. Hardaker. Class 5a: 1st, Robert Ure; 2nd, Chas. J. Bryden. In the amateur and juvenile section the following awards were made:—Class 1: 1st, A. B. Ferguson; 2nd, Miss M. E. Watts; 3rd, Wm. Lindsay. Class 2: 1st, J. T. Reid; 2nd, Evelyn S. Morrison; 3rd, Miss G. Thomson. Class 3: 1st, Miss M. F. Daniel; 2nd, A. B. Ferguson; 3rd, Jas. W. D. Sandison. Class 4: 1st, A. D. Hitchin; 2nd, Robt. Dunlop; 3rd, Miss Peggy Sandilands. Lantern slides: 1st, Herbert Felton; 2nd, Ranald Rigby; 3rd, Dan Dunlop; 4th, Ernest Tinker.

CLIMATE AND PHOTOGRAPHY.—A paper by Mr. H. G. Cornthwaite on this subject appears in the "U.S. Monthly Weather Review" for March. According to an abridgment of it in "Nature," it is mentioned that during a heavy rainfall the light is photographically stronger than in densely cloudy weather without rain, due to the light reflected from the falling raindrops. Tropical daylight is asserted to be about twice as strong photographically as summer daylight in latitude 40 deg., and about four times as bright as winter daylight at this latitude. Chemical activity in developing and fixing processes is greatly increased with high temperatures, and correspondingly retarded with low temperatures. Photographic films and prints may be subjected either to high temperatures or high humidity without excessive deterioration, but not to both in combination. Both prints and films are said to deteriorate rapidly in the moist tropics, but those developed and fixed under tropical conditions have a greater permanence in the tropics than those developed and printed in the temperate zone and subsequently taken to the tropics.

CROYDON CAMERA CLUB.—For good fellowship, coupled with wit and learning, the Croydon Camera Club stands perhaps alone. The amusing, yet interesting, criticism which is levelled at the lecturer, to say nothing of the members themselves, makes it a real pleasure to attend the weekly meetings. One is sure that there will not be a dull moment during the evening, as the club critics are certain to object to the lecturer's point of view, and a witty argument between the members ensues. The session commences on Wednesday, October 4, at eight o'clock, when Mr.

R. J. Rose will show "Some Photographic Odds and Ends." The programme for the session is now available, and may be obtained from the Hon. Secretary, J. M. Sellors, 50, Russell Hill, Purley. Judging by the list of lecturers and their subjects this should be an interesting and instructive session, and the members should have plenty of opportunity to exercise their powers of criticism to the full. Amongst the lectures are many which are calculated to interest the beginner, and this instruction, together with the friendly and jovial spirit of the club, should do much to help him in his work.

PHOTOGRAPHIC INSTRUCTION IN MANCHESTER.—The prospectus of the printing and photographic department of the Manchester Municipal College of Technology is now available for intending students. The photographic section provides evening and all-day instruction in pure photography and the photo-mechanical processes. A complete daylight and artificial light studio is provided for portraiture and general technical negative making, together with an efficient dark-room, printing room, and a well-equipped laboratory. The process studio contains four cameras, one 12 x 10 and three 15 x 12 sizes. Three dark-rooms are provided in this department, enabling wet collodion and dry plate negative making to be accomplished. There is also an etching room, including two etching machines and a complete block finishing room. Instruction is also given in retouching and finishing photographic prints, by expert instructors. Mr. Charles W. Gamble, O.B.E., M.Sc.Tech., is the Director of the photographic departments, and application should be made to him by intending students for particulars of the classes most suitable to their requirements. These classes of instruction should be of great value to persons in the neighbourhood of Manchester who propose to enter one or other of the branches of photography as a means of livelihood. The school session commences on October 2.

THE EASTMAN THEATRE AND SCHOOL OF MUSIC.—An excellently printed four-page art gravure supplement to the "Democrat and Chronicle" of Rochester, N.Y., for September 10, 1922, includes illustrations and particulars of the Eastman Theatre and School of Music. This theatre and school were presented to the people of Rochester, N.Y., by Mr. Geo. Eastman, for the purpose of developing musical talent and appreciation, and were opened to the public on September 4. Mr. Eastman's original gift amounted to 3,520,000 dollars, to which was added, a few months later, 1,000,000 dollars for building and equipment. A smaller hall, which is an adjunct of the School of Music, was designed essentially for recital purposes, but has a complete motion-picture equipment. The organ in this hall represents an investment of 90,000 dollars. The large theatre, which is described as the most beautiful in the world, abounds in architectural beauty and wealth of art treasures, and its equipment and accommodation are said to be surpassed. The auditorium, which has a seating capacity of 3,358 persons, is completely open, no posts or girders interfering with the view of the stage. Music for motion pictures is provided by a full symphony orchestra and an eight-division organ with more than 10,000 pipes, said to be the most complete ever installed in a theatre. Mr. Eastman's interest in music and genius in organisation appear to have found the happiest conjunction in the planning of this notable addition to the social life of Rochester.

PHOTOGRAPHIC INSTRUCTION.—Evening classes of instruction in pure photography have been a special feature of the Battersea Polytechnic, Battersea Park Road, S.W., for a number of years, and have been of great assistance to students of the art. The photographic department of the Polytechnic contains a fully-equipped studio and commodious dark room, both fitted for electric illumination, besides the necessary apparatus for the subjects in which instruction is given. An elementary class on Tuesday evenings, and an advanced class on Thursday evenings, are held, the latter preparing students for the City and Guilds final examination in photography. Mr. E. Senior, the instructor, has a wide knowledge of his subject, and is a very capable lecturer. The fees for these classes, comprising 2½ hours' instruction in theory and practice, is 20s. per session for both the elementary and advanced courses. A special course in enlarging is also provided on Tuesday evenings from 7.30 to 9.30. The fee for this instruction, extending over twelve evenings, is 10s. Mr. Senior is also delivering a course of about twenty-five lectures on photography at the South-Western Polytechnic, Manresa Road, Chelsea, S.W.3, at 7.30 p.m. One hour's lecture is given, followed by practical work. The fees for the course of lectures and practical work is 20s. per session. Practical demonstrations in photo-micrography will also be given at this Institute, commencing May 7, 1923. The fee, covering eight demonstrations, is 5s.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

CO-OPERATIVE ADVERTISING.

To the Editors.

Gentlemen,—I think I must have been the last photographer to register as attending the Congress, since you give the number attending as 291, and my badge number was 292. That I was unable to attend until the Friday was undoubtedly my loss, as it was regret, because of the very attractive programme arranged.

Particularly I regret missing Capt. F. H. Wright's address on Co-operative Advertising on the Wednesday afternoon, which from your report appears to have been very informative and instructive. Unfortunately the address on the same subject on the Friday by Mr. Hopton Hadley was somewhat spoiled by being hurried, through the late start owing to the general annual meeting of the P.P.A. encroaching on the time allotted to Mr. Hadley, and also by the fact that the arrangements for the Congress dinner made it necessary for the chairman to hurry the proceedings, leaving but little time for discussion.

This subject is one of extreme importance to the whole body of professional photographers, and whilst it is fitting that the proposition be left *pro tem.* for the Council to discuss, it is quite imperative that the matter be not pigeon-holed indefinitely, but that ways and means are found of starting the scheme early in the New Year.

For such a great length of time photographers, as a body or individually, have relied on indirect methods of advertising, in many cases bolstered up by broadcast invitation sittings, so that the public have, as a rule, a very poor opinion of photographers from the business point of view, if not from the social. The objection to direct advertising, from the viewpoint of the better class studio, has been that it is undignified and unprofessional; from the standpoint of the cheaper studios, that it probably does not pay. Both views are wrong, because (1) there is nothing undignified in letting the public know what one has to sell, in a decent, straightforward manner; (2) the professional photographer is not "up against" a union, such as the Law Society or the Medical Association, prohibiting direct advertisement. After all, the photographer does sell *things* (photographs, products of his and his staff's services), and not merely services or advice, like the professions mentioned. (3) Since he sells things, why should it not pay the photographer to advertise? It is a proved fact that it pays every other form of business to advertise its goods.

Having arrived at the conclusion that advertising pays, undoubtedly more could be done in educating the public to be photographed oftener by some co-operative scheme, because it is the only way that large sums of money could be raised to tackle the job in any efficient manner. It requires handling by experts and putting out to the right kind of papers, having regard to the variations in the status of different photographic studios and their clientele. I quite agreed with Capt. F. H. Wright that £12,500 is none too much to carry out the campaign. Given skilful handling, with efficient advertisements bringing in results, I think double this amount might be raised the second year, for the price of a new 14 x 8 ft. background from each of the 8,000 photographers calculated as likely to subscribe would bring in about £30,000. Very few photographers would hold out if results accrue.

My question to Mr. Hadley is not reported quite correctly. It was, "Would the methods suggested by Mr. Hadley raise a sufficient sum?" and not, as you say, "Was it really possible to raise sufficient?" My point is that it should be quite possible, but I do not think the amount stated by Mr. Hadley as required for a start would be sufficient.

Another point in the education of the public to want photographs more frequently is, that photographers as a body should devise some ready method by which the public can keep and protect a collection of photographs—something that will take the place of the old family album. It is quite impossible for the public to frame more than a small proportion of the photographs

they receive, if only from lack of space in which to place them. The consequence is that they are soon damaged and put out of sight. If a ready method could be found whereby anyone could keep a collection of portraits in a compact form, ready to look through and show to friends, much more interest would be taken in them, and hence there would be more demand for the photographer's efforts. I enclose an advertisement of an attempt on my own part, but one man can do little, it requires the united effort.

It is an undoubted fact that, despite high taxation and the general high cost of living, the public still have some money to spend, and if photographers as a body are content to sit still and see all this spare cash go to such things as golf, tennis, the cinema, chocolates, etc., they must only blame themselves if the public has very little left for portraiture. It is up to photographers to combine and make the public want portrait photographs oftener by co-operative advertising. Ultimately it would more than pay them to do so.—Yours truly,

JOHN MILLS.

10, Saint Giles' Street, Northampton.
September 23.

THE BEGINNER IN PHOTOGRAPHIC SOCIETIES.

To the Editors.

Gentlemen,—Your correspondent A. V. W. displays a degree of selfishness which, from a somewhat extended acquaintance with society members, I am glad to think must be very rare.

Before beginners can be excluded it must be decided what a beginner is. An experienced professional portraitist is a beginner when he first essays a landscape, and even an experienced amateur who claims to be an all-round expert is, as I know, capable of asking very funny questions regarding such a subject, for example, as stereoscopic photography.

I claim that the beginners, with their overflowing energy and zeal, are the backbone of the societies, both financially and otherwise.

There is no better way of ascertaining the limit of one's own knowledge than by trying to teach others, and many old hands would at times find themselves in difficulties when asked to explain the reason for some of their operations.

My old society (when I lived in London) at Bowes Park held special beginners' evenings, at which demonstrations were given by the more experienced members, and beginners encouraged to work under their supervision. The successes gained by this society at the White City, Crystal Palace, and other similar exhibitions is, to my mind, sufficient evidence that the encouragement of beginners is justified.—Yours faithfully,

H. A. MILES,
Past-President Bowes Park and District Photographic Society.

180, Shaftesbury Avenue, Thorpe Bay.
September 15.

[Letters expressing the same views as those of Mr. Miles have reached us from Mr. R. S. Galloway and Mr. J. Ainger Hall respectively of the Edinburgh and Hammersmith Photographic Societies.]

FLASHLIGHT FOR PORTRAITS OF CHILDREN.

To the Editors.

Gentlemen,—Noting that you advise a correspondent, in to-day's issue, that you "do not think flashlight can be recommended for the portraiture of children," may I venture an attempt at conversion of that opinion?

Flashlight is, to my mind, of greater value in that particular work than, probably, in any other branch. For one thing, the actual duration of exposure is shorter than anything except shutter work in sunlight. So that when a child has been watched or coaxed and the desired expression appears, it can be caught with far less chance of movement than any ordinary studio conditions permit. There ought to be no doubt remaining nowadays that flashlight can easily give as well lit pictures as any other illuminant.

The only other matter on which a question might arise is the suddenness of the flash. Many people have asked me if it does not frighten children. To that I can only reply that in all my experience only one child has shown any alarm, and he was an extraordinarily nervous child, born in specially distressing circumstances. Even in his case it was more the camera being pointed at him than the flash that aroused his antipathy, and I am enclosing for your inspection a print from each of the two exposures taken of that unusually difficult child as proof that flashlight for babies is not only suitable, but that it is the best method of all.—Yours faithfully,

D. CHARLES.

50, Webb's Road, Clapham Junction, S.W.11.
September 22.

[The portraits are excellent in expression and lighting.—EDS., "B. J."]

TECHNIQUE AND THE D. AND P. SLUMP.

To the Editors.

Gentlemen,—*A propos* the article under the above heading in a recent issue, I venture to offer the view of an amateur having a wide and very long photographic experience. I may say that I am very frequently called on to admire "snaps" by friends and relations: these efforts being, in nearly every case, of the D. and P. order. Almost without exception the results displayed horrify me, and cause me to be ashamed of my hobby. I give full blame to the happy "snapper"; but in the majority of cases the "finisher" appears to have "done his worst," and especially in respect to the printing from negatives. Few of these machine-made prints do justice to the better negatives, while they effectually "finish" (!) the poor ones. In this respect I consider the D. and P. man is his own "worst enemy." So far as personal experience goes, I have not, until this summer, had occasion to test the skill of the D and P. "service." However, this became necessary during a holiday tour, in order to test the speed of two recently introduced British films. With a wish to compare results I placed two films with shops of widely differing pretentions, the one, a much window-dressed firm, the other a small chemist's shop in a by-way. Briefly, the results were these: The pretentious firm, which announced "Best Possible Results," all but ruined the film. The timing of development was bad, and the drying so obviously careless as to leave the back of the film badly marked. Pinholes were also numerous. In the case of the "small chemist" the film was developed correctly and with the "best possible results" claimed by the pretentious rival!

This experience goes to endorse the view of "Thermit" that there is far too much slipshod work among those in the D. and P. line of business. In regard to printing, I think it might be said that thousands, possibly millions, of snap-shotters are educated, photographically, on bad gaslight prints, and have never seen first-class work on bromide paper.—Yours faithfully,

LYULPH LUMLEY.

66, Sunny Gardens, Hendon, N.W.4.

POTASS. FERROCYANIDE IN THE DEVELOPER.

To the Editors.

Gentlemen,—On page 544 of the "B. J.," dated September 8, there is a brief reference in one of your replies to the use of potass. ferrocyanide in the developer, you stating—and rightly so—that the idea of using ferrocyanide originated in America some years ago.

About the middle of the year 1884 a New York photographic expert discovered that ferrocyanide was a good thing to use as a constituent of a pyro-potash developer. The idea was noised abroad, although efforts were made, I believe, to keep the discovery secret. At any rate, the use of ferrocyanide became so common that in March, 1885, a standard developer containing the salt was adopted by the Society of Amateur Photographers of New York for some important work then in hand.

The developing formula decided upon was as follows:—

Pyrogallic acid	2 grs.
Soda carbonate	5½ ,,
Soda sulphite	11 ,,
Potass. carbonate	5½ ,,
Potass. ferrocyanide	5½ ,,
Water	1 oz.

The work for which this formula was employed was that of testing (by a special committee) the qualities of twenty-two different brands of dry plates by twenty different makers—eighteen American, one English, and one Belgian.

The plates were also tested with the formula recommended by the makers of the plates. The ferrocyanide formula gave the greatest satisfaction, the workers claiming that when ferrocyanide was used

less pyro was required. Dealing with this particular point, the official report issued by the Society said: "In one case 2 grs. of pyro in our standard developer gave as good results as 5 grs. in the makers. The developer works well with every plate we have tested, though it requires a bromide on some of the extra sensitive plates to prevent fogging."

As many as 254 tests in all were made, and the developer had a good run, but for some reason or other the formula did not live many years, even though efforts were made to embody ferrocyanide in other and more popular formulæ.—Yours faithfully,

W. W. N.

ASSISTANTS AND THE CONGRESS.

To the Editors.

Gentlemen,—I was specially favoured to attend some of the lectures held at the recent P.P.A. Congress, and feel I must make an attempt to express my appreciation, and thanks to all concerned. There are two evenings that stand out as unique to me.

The first is Mr. Pirie Macdonald's lecture. Words fail me to express my gratitude and feeling to such a wonderful man and photographer. If every assistant could have heard him, I am convinced it would have been the finest lesson any photographer could have heard. I had the good fortune to meet him the day before he left, and he promised on his next visit to this country to give assistants an evening. Now we come to the Assistants evening (Thursday). In all my twenty-three years' experience in photography this has been the first assistants meeting. I sincerely hope this is the beginning of many more. I also feel it is absolutely essential for us to have an assistants' association for many reasons, viz., to improve the condition and quality of work and sociability amongst assistants.

Lectures should be given not only on photography, but commerce, science, literature, astronomy, and many other subjects too numerous to mention. Include the trade assistants; they will be a great help to us all, especially the demonstrators, as there are many of us who do not know the way the material is manufactured, I am sure the P.P.A. Council will find the right man to lecture to us.

An exhibition should be held for the assistants only, showing the branch in which they specialise, viz., operating, developing, retouching, printing, finishing, mounting, and judged only on the one subject or branch.

We were told at the meeting that it is necessary for the operator to study the sitter; it is equally important that the master photographer must study the assistant in every branch of the finished result; and the assistant, the master. If conviviality was more in prominence in the photographic workroom the average assistant would be happier.

It must be remembered we all have our livelihood to get, and cannot live on sentiment, but until photography is improved we cannot expect to obtain better conditions and wages, which I hope will soon come.—I remain,

Yours faithfully,

FRANK V. SYMMONS.

43, Dover Street, W.1.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

S. L.—The type of print you have seen was probably produced either upon Kodak "Transferotype," which is a stripping paper and allows the picture to be transferred to any type of paper base, including Japanese vellum, or "Kerotype" transfer paper, made by Criterion, Ltd., Stechford, Birmingham.

C. W.—A burnished mirror reflects approximately 80 per cent. of light as observed by the eye. In the case of using two mirrors, 80 per cent. of the light reflected by the first would be reflected by the second. Thus 64 per cent. of the original light would be available. In practice, however, it is found that a larger proportion of light than these figures show is really reflected.

W. S.—Your background should first have a good coating of thin starch paste rubbed well into the material. When this is dry, any of the good makes of washable distemper may be applied. We have treated this matter rather fully in the "B. J." of the following dates: May 20, 1921, p. 300, and January 27, 1922, p. 47. Copies of these issues may be obtained from our publishers, price 9d. each, post free.

A. O.—The approximate electric power required by you is as under:

(1) Printing box for gaslight and bromide, 80-100 c.p.
(2) Enlarging, 400 c.p.
(3) Studio, two or three lamps, totalling 6,000 c.p.

Using half-watt lamps, this would need a supply of about 3,250 watts. If you divide this figure by the voltage you have available you will obtain the amperage necessary to light all your lamps at once.

A. C.—Your difficulty in firing flash powder by a high-tension spark is that the metallic powder proves a conductor for the current, and consequently the effect of the spark is lost. If you have electricity available it is best to fire the powder by means of a piece of fine fuse wire: when the current is switched on the fuse burns out, thus igniting the powder. It is possible to use the lamp you mention at the distance you require, a special long wire release being provided for the purpose.

C. R.—We have never seen any larger ferrotype plates than 14 x 10. As they are, we believe, all made in America, it would be difficult to get special sizes. If the number you quote is correct, your Dallmeyer lens is the stickyback size. The fact that it has Waterhouse diaphragms and is not marked "Patent" would indicate that it was a kind called many years ago the "New Stereoscopic Lens," but so far as we know none of these would bear so high a number. In any case, it would be a Petzval type portrait lens. We cannot fix a selling value.

DAVID C. PRICE.—(1) We do not know of a material which is perfectly opaque (free from holes) in a single thickness, and, at the same time, is a reasonable price. For blocking out the whole of the light absolutely, two blinds are necessary whatever the material. We have used the material sold by any large draper as "silesia" satisfactorily, although at the present time it is rather expensive. (2) A photographer has no right to make any use of prints from a customer's negatives without the customer's permission, even though the prints have not been paid for owing to any cause. Under copyright law the owner of the negative in such circumstances as you describe has the sole right to make and exhibit prints from the negatives.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3257. Vol. LXIX. FRIDAY, OCTOBER 6, 1922. Price Fourpence.

Contents.

SUMMARY.

The series of reviews of the exhibition of the Royal Photographic Society is brought to an end by a notice of the natural history section written by Mr. Harold Hurden, who finds much to commend from both the technical and pictorial standpoints. (P. 603.)

Judged by the prints at the exhibition of the Royal Photographic Society, bromide paper out-distances all the other processes in the production of prints (many of them, portraits) having a claim to artistic quality. (P. 602.)

We greatly regret to record the death in his 81st year of Major-General J. Waterhouse, for many years assistant surveyor-general in charge of photographic operations of the Indian Survey Office, and the author of many notable contributions to photographic and photo-mechanical processes. (P. 604.)

It is announced that next year's Photographic Fair will be held at the Holland Park Hall, close to Shepherd's Bush station. The Fair is to remain open from Thursday, March 15, to Saturday, March 24. (P. 601.)

The vagaries of our present system of protection of industries by means of a duty on certain classes of imported goods are exhibited by the successive official changes of front which have been made in reference to gallic acid. (Pp. 601 and 605.)

In a leading article we have some hints to give on the choice of focal length of lens in reference to the size of the plate. It cannot too often be emphasised that the "drawing" of the subject is dependent on the view point, and that the scale of reproduction is determined by the focal length of the lens. (P. 602.)

An American paper company, so it would seem, has put forward identically the same suggestion for a series of standard sizes which Mr. Alfred Watkins published in our pages just about two years ago. (P. 602.)

Many hints on paints and varnishes were given by Mr. Vivian Jobling at the Croydon Camera Club. (P. 611.)

"COLOUR PHOTOGRAPHY" SUPPLEMENT.

Mr. Charles Raleigh concludes his reminiscences of the many technical difficulties in the working upon the commercial scale of the Kinemacolor process of colour cinematography. (P. 37.)

M. Eugène Muller has recently recorded his observations on the occurrence of a prevailing blueness in Autochrome transparencies. By use of a somewhat deeper compensating light-filter he has been able to obtain Autochrome transparencies of entirely satisfactory colour rendering. (P. 38.)

An invention of a triple-film plate for the simultaneous making at one exposure in an ordinary camera of the set of colour-sensation negatives is that of E. A. Lage, and appears to be the partial basis of the process of colour photography recently shown for the first time at the trade exhibition of the P.P.A. Congress. (P. 40.)

Still another variant of the numerous methods of cinematography in colours is described in a recent patent specification. (P. 39.)

EX CATHEDRA.

The Photographic Fair, 1923. An announcement of great interest respecting the Photographic Fair, which for a number of years past has been held at the Horticultural Hall, Westminster, is that its organiser, Mr. Arthur C. Brookes, has been able to secure the Holland Park Hall for next year's Fair, to be held from Thursday, March 15, to Saturday, March 24. Although the Horticultural Hall is an excellent building, its size has not been sufficient for the accommodation of a trade exhibition upon a scale in correspondence with the magnitude and importance of the photographic industry. The Holland Park Hall will provide about three times the floor space, in addition to that in galleries which will be devoted to a variety of attractions. While the new venue of the Fair is somewhat further from the centre of London, it is probably more accessible than the Horticultural Hall, since it is a stone's throw from the Shepherd's Bush station on the Central London railway, and also stands on a main bus route. Also, the period of the Fair can be made slightly longer, and the date made to coincide with the opening of the photographic season, since Easter Monday next year falls on April 2, just over a week after the closing of the Fair.

* * *

See-Saw Protection. If anything were required to demonstrate the beautiful uncertainties of the system of protection which is embodied in the Safeguarding of Industries Act, it is the proceedings of last week in reference to gallic acid, which are reported on another page. One has only to review the successive stages in the treatment of this substance according to the Act in order to see the ridiculous variations to which this form of tariff legislation is susceptible. Soon after the Act was passed, gallic acid was included in the list of chemicals in which the duty of 33⅓ per cent. is levied on importation from abroad. The Board of Trade so included it for reasons not disclosed. At any rate, they regarded it as a "fine chemical," that is, a chemical of special purity. Objection was, however, taken, presumably by importers, to its inclusion, so the Board of Trade, again for reasons that we know, took it off. Now comes a chemical manufacturer, Mr. Rose, with his "complaint" that gallic acid (which he manufactures, and also pyrogallic acid from it) is a "fine chemical," and ought to be on the list and be liable to the duty when imported into this country. The Board of Trade, having taken gallic acid off the list, could hardly put it back again by the same official process, for even a Government department has at times a sense of the ridiculous, so it refers the dispute to its officially-appointed referee, Mr. Atkinson, K.C., and Mr. Atkinson has agreed that gallic acid should go back into the list of protected chemicals. It appears quite likely that the

people who objected at the very outset will object to the restoration of gallic acid to the list as a "fine chemical," for it is stated in the "Chemist and Druggist" that they deny having received any notice of the "complaint." What will the Board of Trade and Mr. Atkinson do then? The photographic importance of the case is slight. Gallic acid is used for making pyrogallic acid, the classification of which as a "fine chemical" is not disputed. Mr. Rose, therefore, has the protection of the Act for this product. It would seem that of the two substances, gallic acid (the raw material for his pyro) is the more important to him, since he sets the machinery of the Act in motion in order to make the imported supplies of it more expensive.

* * *

The Success of the Bromide Print. The bromide process, in spite of all the newer printing mediums, still holds pride of place with the serious worker. Many new methods of so-called pictorial reproduction are available, each of them requiring much study and experience, on the part of the worker, to bring out their best possibilities. But the bromide print, easy to manipulate, strong, and yet with perfect gradation, still remains the favourite method of reproduction with exhibitors. At the Royal Photographic Society's exhibition, now open at 35, Russell Square, there are in the pictorial section 154 prints, 115 of which have the name of the printing process attached to the titles in the catalogue. Of these 115 prints, 64 are by the bromide process. Next to this in number is Bromoil (direct and transfer), which claims 24 prints, leaving 27 to be distributed over 9 other printing processes. The bromide process is therefore a long way in front for popularity, and, undoubtedly, the large amount of careful attention given to the manufacture of so many fine grades of paper and speeds of emulsion has had much to do with this. There is no negative nowadays that cannot be suited by some speed or brand of bromide paper, and prints eminently suitable to the full gamut of pictorial subjects may be obtained. The newer grades of warm black paper have become very popular, giving, as they do, fine rich mezzotint effects without the trouble of after-toning. They are specially suitable for portraiture and landscape in the present style; and it is prints on these papers which fill our exhibitions and give so much pleasure to the admirer of photographic craftsmanship.

* * *

Standard Sizes. If we are to draw an inference from a very partial description which appears in the current issue of "Process Work," an American firm, the Chemical Paper Manufacturing Co., of Holyoke, Mass., has either re-discovered or borrowed the idea for a series of standard sizes, which Mr. Alfred Watkins published in the "B. J." of January 2, 1920. It will, perhaps, be remembered that Mr. Watkins pointed out that a rectangle having its two sides in the ratio of 1: $\sqrt{2}$ (*i.e.* 1·414) yields two rectangles of this same proportion of sides when folded on itself. Geometrically, it can be shown that a rectangle of this shape is the only one which exhibits this property. Mr. Watkins adopted it as the basis of a series of rational sizes for photographic plates. The Chemical Paper Co. evidently have a similar aim, since a diagram of theirs shows the successive smaller areas, all of the same shape, obtained by folding the large sheet once, twice and thrice upon itself. But "Process Work" appears to think that this property is obtained, in some unexplained way, by setting off the series of increasing areas from a single point and on a diagonal or hypotenuse common to all of them. It has, in fact, nothing whatever to do with that, but arises only from the 1:1·414 ratio of the basic rectangle adopted for the production of others by enlargement or reduction. The system has merits, particularly in the production of books, and therefore it is no more than fitting that the essential basis of it should be identified with Mr. Watkins's observation of nearly two years ago.

FOCAL LENGTHS AND PLATE SIZES.

A good many years ago the late T. R. Dallmeyer wrote an interesting little book, entitled "A Simple Guide to the Choice of a Lens." It was a curious feature of this publication that, although it was full of valuable information on lens matters generally, there was only one point in it which justified the title. In one place it did recommend the choice for all-round work, of a lens having a focal length equal to the diagonal of the plate upon which it would most often be used. There was, of course, nothing novel in this recommendation. For a score of years previously lenses of the more rapid types had been listed for the various standard sizes of plate on practically this basis, that is to say, the normal focal length for a ¼-plate was 5½ inches; for a 5 x 4, 6 to 6½ inches; for a half-plate, 8¼ inches, and so on. Although it is impossible to trace the origin of this standard, many years of experience have proved its advisability, and the novice in lens buying will do well to be guided by it.

It must not, however, be assumed that there is any fetish in this proportion, for in many cases a much greater comparative focal length will be found to give better results, while in others a shorter one, giving a wider angle, is sometimes demanded by the nature of the subject. It has been urged by some writers that the focal length of the lens should be equal to the distance at which the resulting photograph would be viewed, and that the average distance for people with normal vision being 14 inches, all photographs, no matter what their dimensions, should be taken with a 14-inch lens. This is manifestly absurd, in view of the very large proportion of photographs which are taken upon plates smaller than whole plate, upon which size a 14-inch lens might profitably be employed with most subjects. It must never be forgotten that perspective is governed entirely by the view-point, and is not affected either by the construction or focal length of the lens, provided that the same angle is included. This can be demonstrated by taking one negative with a double lens and, without moving the camera, another with one of the components; upon enlarging the central portion of the first negative until the details are exactly the size of those in the second, it will be found that the outlines exactly coincide.

Wide angle lenses, that is, lenses whose focal length is short in relation to the plates they are used upon, are responsible for much of the bad reputation which photography has earned among artists. The artist, either consciously or instinctively, reconstructs his perspective when he is drawing a subject in a confined position. But the photographer has no such power. Provided that his lens is rectilinear, he is forced to put up with a correct rendering in linear perspective, no matter how offensive to the trained eye it may appear. Wide angles are a necessary evil in many branches of commercial photography; they should be avoided by the artistic worker, unless he has a definite object in employing them.

In classifying lenses no attention should be paid to any descriptive engraving upon the mount. For all practical purposes, the focal length and the extreme size of plate which can be covered are the necessary data; apart from the intensity or speed, these indicate the

limits of their usefulness. For example, a 12-inch wide angle landscape lens, made to cover a 12 x 10 plate, may do more effective service as a narrow-angle lens upon a 7 x 5 or 5 x 4. Conversely, a 5½-inch anastigmat, normally a quarter-plate lens, may be used at a pinch as a wide-angle lens upon a whole plate.

The original type of telephoto lens, especially when of rather low power, is an instrument which has never been appreciated at its true value by the great majority of photographers for either technical or artistic work. Like many other new inventions, it fell into the hands of the "stuntmongers," who strained its capabilities to the utmost, and created an impression that it was unsuitable for everyday work. The great merit of this type is its possession of a variable focal length, so that with the same lens the desired angle can be embraced upon practically any size of plate. With a moderate power attachment the normal plate is covered with a minimum equivalent focal length of three times that of the positive lens. Thus, using an eight-inch rectilinear and a four-inch negative attachment, an equivalent focal length of 24 inches is obtained with a camera extension of eight inches, while for every four inches of camera extension, eight inches are added to the focal length. When objects at a considerable distance have to be taken, there is often a lack of contrast, but this is due to the atmospheric conditions, and not to the lens. It may be minimised by using a slow "contrasty" plate and developing fully.

The modern one-focal-length telephoto lenses, such as the Teleros, Dallon and Cooke, differ only from ordinary lenses in that they only require for distant objects a camera extension of about half their equivalent focal length. These lenses have somewhat limited covering power, and cannot be used for anything like the normal angle, so that it should always be considered whether, in purchasing, say, a 16-inch lens, it would be advantageous to procure an anastigmat which would cover up to 12 x 10, or a telephoto of the same aperture which would cover less than a whole plate.

THE EXHIBITION OF THE ROYAL PHOTOGRAPHIC SOCIETY.

The interest in the exhibition of pictorial and technical photography at 35, Russell Square, shows no signs of waning, and visitors are pouring into the society's house daily in increasing numbers. This is not surprising considering the variety of the work which is being shown and the excellence of the photographic technique. The arrangement of the exhibits this year allows the visitor to obtain full advantage of the various branches of the photography that are represented, and undoubtedly this is helping to a large degree, towards the exhibition's success. To-night, Friday, October 6, Mr. Frank Lambert is lecturing upon "The Beginnings of London," illustrated by lantern slides, and on Tuesday, October 10, Dr. Reginald S. Clay will deliver the twenty-fifth annual Traill-Taylor memorial lecture. His subject will be "The Development of the Photographic Lens, from the Historical Point of View." On Friday, October 13, Dr. C. Atkin Swan will deliver an illustrated lecture, "Carcassonne and the Pyrenees," a subject in which Dr. Atkin Swan is particularly well versed.

We are publishing below a full review of the natural history section of the exhibition by Mr. Harold Hurden. This branch of photographic work, calls, perhaps, for greater care and patience, coupled with skill and endurance, than any other branch of the art, and it is only by prolonged study and minute attention to details that photographs of the kind and quality shown in this section of the exhibition are obtained.

THE NATURAL HISTORY SECTION.

Whether it is due to a rigorous selection, or whether the standard of work has so much improved, it is certain that the collection of prints in this section, now for the first time given a room to itself on the ground floor at the Society's home, at 35, Russell Square, is the best that has ever been gathered together in an exhibition. The high technical standard of the photographs is beyond question. It is probable that the exhibitors are not all naturalists in the purely student sense. One can detect subjects whose appeal has been from sheer beauty. Others suggest more the delight of the sportsman, the courage and patience of the man who delights to take risks. Can anything be more exciting, and at once more incongruous, that riding alongside a herd of wild, galloping giraffes in a Ford car? The very idea must raise a smile. But M. Maxwell's work, No. 267, is by no means funny. It is a wonderful photograph of three wild giraffes taken in precisely these circumstances, and it sadly upsets the layman's idea of the gait of these animals. It cannot be the privilege of many to see so unique a sight, and it comes as a great surprise to note that the galloping gait is so different to the trot. With this beautiful creature now little more than a survival, one can but hope that Mr. Maxwell is more zoologist than hunter. The courage required to snapshot a wild bull elephant at eight yards range is brought forcibly to our minds on viewing another of Mr. Maxwell's prints, No. 266.

Of 116 prints in this section, ornithology claims almost exactly half. This is, perhaps, inevitable if we consider the appeals which natural history subjects can make to photographers: and it emphasises the point that the exhibitors are for the most part photographers first, and naturalists afterwards. Botany might have claimed more than it has, if beauty were the only appeal; but the birds present just that combination of beauty of subject, with patience, stealth, and no small measure of courage, which is so satisfying to the primitive hunter instinct. It may be that the pure naturalist can be more looked for in other branches of natural science. The arachnoids are not beautiful, but the value of Hugh Main's works, 158, 159, and 160 is beyond doubt, as is that of some others of his. Nor are toads beautiful, but Dr. Rodman's "Spanish Toad" (214) is a beautiful photograph, which is not just the same thing. It is doubtful, however, if the lens he uses is quite the instrument for this kind of work. The fine rendering of "Rust Red Anemone," 185, and "Pale Pink Anemone," 188, both by Alan V. Insole, should be noted. Dr. J. B. Pardoe's "Black Snake," 225a, is especially good, and his "Snapping Turtle and Frog," 186, though rather dreadful, is a valuable record. Anything which can be done to make the forms and life history of our garden pests more familiar to us is of the utmost value, and E. A. Robins' three prints, 180, 181, and 182, of "The Gooseberry Sawfly and its Eggs and Larva," are good examples of this class of subject. There are some good photographs of moths and butterflies, of which E. J. Bedford's "Red Admiral" (196), is particularly soft and attractive.

In the zoological section Miss M. A. Booth has a panel of nine prints (No. 157), of a "Mother Squirrel and some of her Offspring," quite delightful studies of this little animal now so familiar to Londoners. By the way, Miss Booth appears to be the only lady exhibitor in the natural history section. W. H. Hadley has achieved something of more than natural history interest in his two prints of "Lions" (210 and 215). They have more than usual pictorial value, as has Dr. Pardoe's "Ever Watchful" (262)—a herd of deer under a tree. This is beautiful photography. No. 251, "Marmotte from the Mountains of Savoy," is noteworthy of such a shy creature. The botanists have not so many works as might have been expected. Their usual flower study is conspicuous by its absence, but scarcely anything could be finer work than F. G. Tutton's two studies of "Japanese Peonies" (193 and 203), in which he has retained the delicate texture of the petals in a most mas-

terly way. In 107, "Bladder Campion," J. A. Sharpe shows two pretty prints of this familiar British plant. Other exhibitors in this group are E. J. Bedford, with amongst others, the rare "Lizard Orchid" (104), and John J. Schoonhoven with "Broom Rape" (183), and "Indian Pipe" (134), two useful contributions to pictorial botany. J. A. Sharpe also shows some fungi (174, 204 and 212)—tributes to his skill in colour rendering. Dr. Hastings's "Soil Formation on the Alps" (240), is a capital lesson in progressive soil formation, in which he illustrates by nine prints the progression from crustaceous lichens to the Alpine meadow. This is also good geology.

It is to the ornithologists that the medal has fallen, and no quarrel can be with the selection committee for their award to Ralph Chislett for his "Variations in the Plumage of the Arctic Skua" (No. 243). In six delicate and almost perfect studies of this bird, Mr. Chislett has recorded some of its plumage variations with consummate skill. It is fine photography and good natural history. Mr. Chislett has other prints in this section, which should not be overlooked. Capt. Knight well sustains his reputation with three fine prints. No. 219, "Female Sparrow Hawk at Nest," deserves special mention. The beautiful pose of this bird is most arresting, and the picture is of great merit. No. 235, "The Life History of the Night Jar," by T. M. Blackman, is a series of six fascinating photographs which, apart from their other merits, must be hard to beat as a natural history record. The difficulties overcome so successfully in this work must have been great. Mr. Blackman has another excellent print in No. 205, "Meadow Pipit Feeding Young Cuckoo." This has, of course, been done before, but that scarcely lessens the interest in this study. C. J. King has a similar subject in No. 211. In this case the foster mother is a Rock Pipit. In 239 and 241, "The Herald of the Dawn," and "The Warden of the Marshes," H. M. Salmon shows two pleasant little pictures of no mean pictorial interest. Dr. Pardoe's fine bird studies will appeal to almost everybody. His quaint "Wood Pile" (259), is an especially clever composition of an owl sitting on the shaft of an axe driven into a log. His "Blue Jays" (200), should also be seen. Two other studies of Jays should be mentioned; No. 168, by S. Crook, and No. 201A, by T. M. Fowler. In each the plumage colour has been well suggested, but Mr. Fowler's print gives the more pleasing definition for such work. Colour rendering of a high order is seen in T. Robinson's "Yellow Wagtail" (202). W. J. Palmer exhibits photographs of resident and migratory birds. "The Wryneck" (255) is, perhaps, commoner in the home counties than anywhere else in Britain, and this is a good example. Oswald J. Wilkinson's works are, as elsewhere, of a high standard, and are valuable contributions alike to natural history and photography. His "Warblers" (169 and 170) are particularly fine. Good work is also shown by Jasper A. Atkinson, E. Smithalls, G. C. S. Ingram (the latter's "Reedwarblers and Young" (216) is noteworthy) and E. J. Bedford, whose soft and pleasant print of "Robin" (197), strikes just the right note in a British exhibition. Much of the work in this room could equally well have been hung in the pictorial section. It demands, moreover, many rare qualities in a photographer.

HAROLD HURDEN.

DEATH OF MAJOR-GENERAL WATERHOUSE.

WE very much regret to announce the death, on Thursday in last week, September 28, of Major-General James Waterhouse, in his 81st year. He was buried in the graveyard of Eltham Parish Church, on Tuesday last, when the ceremony took the form of a full military funeral, attended by the band of the Royal Artillery.

General Waterhouse, late Assistant Surveyor-General of India, was born July 24, 1842, and received his education at University College School and King's College, London.

In 1859 he joined the Bengal Artillery, and spent the following 38 years in the Indian Army, during which time photography played no unimportant part in his eventful career. In 1861-2 he was commissioned to photograph the native tribes of Central India, and during the next few years was stationed in many places, including Saugor, Delhi, various hill stations and Allahabad, till June, 1866, when he was transferred to the Bengal Staff Corps, and a month later appointed to the charge of the photographic operations in the Surveyor General's Office at Calcutta, which post he held till his retirement in 1897.

Before taking up this work, however, Major-General Waterhouse spent five months in the offices of the Great Trigonometrical Survey at Dehra Dun, in order to undergo a course of training in photo-zincography, finally taking up his duties in Calcutta in November, 1866.

During the period of more than 30 years in which Major-General Waterhouse occupied this important post he worked out officially many improvements in photo-zincography, photo-collotype, and other processes of reproduction used in the office, and introduced the waxed sand process of heliogravure. He also took part in several important expeditions, being deputed to assist Colonel J. F. Tennant, R.E., in photographing the total eclipse of the sun at Dodabetta in December, 1871, also the transit of Venus in December, 1874, and was in charge of the Indian Eclipse Expedition to Camorta in 1875.

During his residence in Calcutta General Waterhouse did much valuable experimental work. He was the first to experiment with eosine as a colour-sensitiser. This was in 1875, when he published his results as to its properties in rendering haloid salts of silver sensitive to yellow light. Another of his important discoveries was the extreme sensitiveness for the red and ultra-red spectrum imparted to gelatine dry-plates by an ammoniacal solution of alizarine blue.

In 1890 he was awarded the Progress Medal of the Royal Photographic Society for his spectrographic observations of the action of dyes on dry plates and for orthochromatic photography, and in the same year discovered and investigated the curious action of small quantities of thiocarbamide added to an alkaline developer in reversing the photographic image on dry plates, and showed its application to photo-engraving.

Photograph by H. Wayland.
THE LATE MAJOR-GENERAL WATERHOUSE.

In 1893 he investigated the electrical action of light upon silver, the results of which were published in the "Journal of the Bengal Asiatic Society," and in 1895 was awarded a Voigtländer medal by the Vienna Photographic Society for his researches in scientific photography.

Since his return to Europe in 1897 General Waterhouse had carried out a number of investigations relating to the scientific side of photography, including the sensitiveness to light of silver and some other metals and the direct *visible* images obtained thereon, and had made several interesting discoveries regarding the early history of the camera-obscura, the telephotographic lens, and photography with salts of silver. Many of his results have been published in the pages of "The Photographic Journal," "The British Journal of Photography," and other technical and scientific papers.

General Waterhouse was president of the Royal Photographic Society in the years 1905 to 1907, a period when the politics of the Society were by no means quiet, and probably were not particularly congenial to one of his peaceful temperament. A man of a most amiable and modest nature, his passing will be deeply regretted by the great number of those of the older generation in photography who had occasion to benefit from his great stores of knowledge and his invariable readiness to lay them at the disposal of inquirers.

SELF-TONING PAPER FOR PROFESSIONAL PORTRAITURE.

Self-toning papers appear not to have found a firm footing in the printing departments attached to the studios of our leading portraitists. Introduced primarily for the labour-saving amateur worker, the majority of professional workers appear to be content to let the amateur have the paper and to consider it his own, indeed, I have heard of some professional workers who have considered it to be *infra dignitatem* to confess an admiration for self-toning paper.

The makers of Seltona have perhaps done more than any other in the way of encouraging professional portraitists to use self-toning papers and have undoubtedly reaped the greatest benefit. The excellent examples of studio portraiture (nicely finished, and in folders as a progressive professional would produce them), issued by the manufacturers of Seltona, have no doubt led many workers to adopt the paper. But much more remains to be done by some of the other makers in producing perfect papers before their products will occupy the positions they deserve to take up in the workrooms of professional portraitists.

Many photographers have given self-toning paper a trial and have not secured the good results they expected to get, results which perhaps would not sustain the reputation they have worked hard to secure. What the photographer requires to do is not to experiment with one paper, but with several, selecting those as widely different as possible from each other and to keep to the one that suits and gives the best results from his negatives. There is a wide difference between some of the different makes of paper, and selecting one at random does not always prove satisfactory. The type of negative is an important factor, the negative doing much to govern the final tone of the prints. There are no bad British-made self-toning papers on the market, but some are far more suitable for a given negative than are others, especially when the paper is manipulated in the simplest manner possible, i.e., without the alternative manipulations many makers suggest.

As is well known, practically every make of paper will give a series of tones by varying the treatment, but the much boomed—and real—charm of self-toning paper is its simplicity, and if one is compelled to treat a paper somewhat elaborately to get the tone wanted, one may almost as well keep to ordinary P.O.P. and gold toning.

Rather than play about with preliminary or supplementary baths, along with hypo solutions of various strengths and times of immersion, I suggest that the worker try three or four different makes, adopting for each the simple and time-saving manipulations recommended by each maker, and use that which suits him, or rather suits the type of studio negative he is in the habit of producing.

As all makes of paper are good it is perhaps a little invidious to recommend any particular make, but to those who wish to make trials in the manner I have suggested I would recommend either Seltona or Paget Matt along with either Barnet "Bartona" or Griffin's "Goldona" glossy. The two matt papers are of the collodion type, while the two glossy papers are gelatine. And I may here remark that whatever make of self-toning paper the portraitist may use he will find the glossy gelatines and the matt collodions of the greatest service.

One of the common complaints about self-toning paper for professional work is the difficulty of getting, say, a dozen portrait-prints of the same tone, or of getting to-day a tone exactly like that secured yesterday. But I have never considered this a serious drawback, and have rarely met with it. When the trouble does arise it is generally caused by attempting to treat too many prints in the same lot of hypo solution. Obviously, a twelfth print placed in a dish of solution in which there are eleven others will not be attacked by exactly the same kind of solution that the first print met with; hence some variation of tone. Better to treat a smaller number of prints in a corresponding smaller quantity of solution.

Many failures with self-toning paper in the past have no doubt been attributable to faulty hypo, but hypo is better to-day than it has been for the past seven years or so, and bad samples are now rare. The best hypo for self-toning paper is that known as "pea crystal," the commoner and rough variety being at times a little too impure for self-toning paper, though serviceable enough for negative and bromide paper work. Alkalinity of bath is so important for good work with all self-toning papers that testing with litmus paper is desirable; the fixing bath should turn red litmus paper to a blue, and should there be any uncertainty, proper alkalinity may be assured by adding a little bicarbonate of soda to the hypo solution.

PRACTITIONER.

THE SAFEGUARDING OF INDUSTRIES ACT AND FINE CHEMICALS.

On Tuesday, September 26, a case under Part I. of the Safeguarding of Industries Act of interest to the photographic industry was heard by the Referee. It may be explained that under Part I. of the Act the Board of Trade has issued a list of many hundreds of substances, including large numbers of chemicals, which are dutiable when imported from abroad. Objections to the inclusion in, or exclusion from, this list are heard by Mr. Cyril Atkinson, K.C., who has been appointed Referee for this purpose. Generally speaking, the list issued by the Board of Trade includes all fine chemicals, and thus most, if not all, photographic chemicals are dutiable under the Act. The case in question, however, concerned gallic acid, and the circumstances attending it serve to illustrate the difficulties of administering the Act, so far as the Board of Trade is concerned.

Gallic acid, of course, is obtained as a stage in the manufacture of pyrogallic acid, and at the time of the "complaint," reported below, whereas pyrogallic acid was, and still is, on the list of protected substances, gallic acid had been excluded from the list. When the list was originally published, towards the end of last year, gallic acid was included, but owing to complaints, presumably by importers, the Board of Trade was induced to remove gallic acid from the list of dutiable articles under the Act. This immediately brought a protest from the manufacturers in this country, and, apparently in a dilemma, the Board of Trade thought it best to leave the decision to the Referee.

The complainant was Mr. J. L. Rose, of Abbey Road, Barking, who commenced the manufacture of gallic acid, pyrogallic acid and gallamide in 1914, when there was a shortage of gallic acid owing to the fact that there had been no manufacture of it in this country for 30 or 40 years, all our supplies having been imported from Germany. Although perhaps it need hardly be explained here, gallic acid is made from gall nuts, which are excrescences formed on oak trees, the result of the puncture of the oak by an insect. The tree, in endeavouring to deal with the parasite, forms an excrescence or small round knob about the size of an oak apple.

Mr. Rose explained, *in camera*, his method of manufacturing gallic acid, and also at the same time gave information as to the size and nature of his plant, output, etc. He claimed that the manufacture of gallic acid is essentially a fine chemical manufacture, and although the Board of Trade originally took the same view, it now argued before the Referee—not too confidently, it must be admitted—that the manufacture is more in the nature of that of a heavy chemical. Strictly speaking, the Board of Trade—or rather the responsible officials—still held to their original view that gallic acid is a fine chemical, but having removed it from the list on the ground that it is a heavy chemical, the position was bound to be defended.

In all previous cases which the Referee has heard—and the majority have related to chemicals—he has endeavoured to come to a decision from an examination of the manner in which the trade has treated the particular substance in the past, and following the same line in this case, after hearing evidence from Mr. C. A. Hill, the managing director of British Drug Houses, Ltd., he said he was satisfied that the trade had always regarded gallic acid as a fine chemical. Whilst intimating a decision in favour of the complainant, the Referee said he would give a considered decision in writing. It should be mentioned that although those who had originally successfully argued to the Board of Trade that gallic acid is not a fine chemical had been notified of the proceedings, nobody put in an appearance in opposition.

Mr. W. J. U. Woolcock, M.P., general manager of the Association of British Chemical Manufacturers, who presented the case for Mr. Rose, made the strong point that the Safeguarding of Industries Act was specially intended to protect industries that had been started in this country since the war, and that here was

case in which the particular substance had not been made in England for 30 or 40 years, but the manufacture of which had been begun to meet the needs of the nation owing to foreign supplies being cut off by the war.

THE EXTRA SMALL STOP.

When a small object is to be photographed which contains a wealth of fine detail in several planes one has a choice of methods, supposing that the detail is required to be rendered sharp throughout. For this sort of subject a lens of too short a focal length must not be used, or the violence of perspective becomes noticeable. That is to say that whatever lens one uses the diameter of the image should not exceed half the focal length, so that one usually is compelled to be satisfied with a comparatively small image which can be enlarged as required afterwards.

It became necessary to arrange a standard output for continuous work of this kind. Enlarging was ruled out, first, because very fine detail is not improved thereby and it was essential to have negatives not only very well blocked out, but also available for printing at a moment's notice at any time. The subjects also were such as to render the production of really good enlargements a matter for anything but hurried procedure. Therefore whole-plate contact work was decided upon. Now, anyone who has ever focussed upon a large head, for instance, on a whole-plate knows that even with a comparatively small stop all details are never microscopically sharp. In fact, in the work in question (a large series of scientific instruments) so great was the depth required that even *f*/64 was not small enough, using a 13-inch lens upon the whole-plate. Therefore the diaphragm of the lens was altered (simply by lengthening the slot in the mount slightly) so that two stops smaller could be obtained, viz., *f*/90 and *f*/128.

As in many cases the objects were photographed from half to full size the actual extension of the camera varied from 150 per cent. to 200 per cent. of the lens focus, so that the actual aperture went down to as low as *f* 180 and even *f*/256. The oft-repeated dictum that below *f* 70 a lens begins to give less sharpness was found to be a groundless superstition. As the subjects themselves were in part very dark in character, and a filter was almost always used the exposures were comparatively long ones. Both for this reason and because of the dimness of the image reaching the plate, it was found necessary to carry out this work when the light was reasonably favourable, otherwise prints were liable to be disappointing.

Focussing at times was a matter of great difficulty. All the various movements of the camera were frequently brought into play in order to get a particular view-point while retaining perpendiculars, as well as getting the plane right which would procure the best all-over sharpness when stopped down. Owing to the long exposures, and the number of articles that had sometimes to be taken in a limited time, the smallest stops could not be used indiscriminately, and it was found that the extra trouble involved in the careful focussing was more than balanced in the time eventually saved. At the same time it was not found possible to select this plane by any mathematical method because hardly ever was the axis of the lens anything like perpendicular or central with the plate, and character of the subjects was usually too complicated also.

As soon as the diaphragm began to be turned below *f*/22 it became increasingly difficult to know when the various details were getting sharp, even when using a magnifier that allowed one to examine the image at the best angle for a bright vision. A device was at length evolved to overcome this difficulty. A few 4-volt bulbs, were bought such as are used in pocket "flash-lamps." The holders for these had each a length of flex about eighteen inches long and at each loose end of the wire a spring clip was soldered. Simply by placing a bulb at each of the outside points of the article, either by just laying it down, or if necessary by twisting the flex round a projection, and temporarily clipping the other ends to the terminals of a battery it became possible to see each tiny filament growing brightly, however small the stop, and so observe when each became sharp.

The whole electric outfit packed into a match-box and a battery could always be borrowed where such goods as those described were to be photographed. When calculating exposures for these very small apertures it became necessary to take into consideration not only the nominal aperture as marked, but also its actual value in accordance with the distance from lens to plate. Then the nature of the subject and of the strength of light had to be accounted for. By this I do not mean merely the meter-reading, but that just as in colour-work a meter-given exposure in a poor light has to be multiplied considerably if a satisfactory negative is hoped for, and with dark subjects all the more so. It must be remembered too that with such tiny stops as those described even in a good light the actual illumination reaching the plate is very dim indeed when such subjects are photographed through colour-filters, and the extra allowance should be made even if the light outside the camera seems bright. The old motto of giving a little extra "for luck," however, is far better if translated into a scientific method of calculation. This may be done by means of a few trial exposures, from which definite facts may be deduced and the results applied to any particular case that may arise. D. Charles.

Assistants' Notes.

Notes by and for assistants will be considered for this column. Payment for accepted contributions is made on the first of the month following publication.

Legal Photography.

The craze for speed seems to have infected even the legal profession. The rapidity with which photography can be executed (and is daily carried out in newspaper work) has apparently impressed the business world, so that results frequently are demanded within a few hours of the order being placed, and sometimes even in less time. The fear of losing an order may cause the acceptance of a job to be done under rush conditions, but the opportunity should not be lost of pointing out the advantage of giving longer notice for such work.

It is so little known (outside the profession) that a photographer can easily diminish the strength of a case by carelessly made photographs, or by having to make them under adverse conditions of light and time.

Of instances that occur from my own experience, the case of a cyclist who was thrown by a tram line standing up above a bit of road is, perhaps, the clearest. A photograph, made immediately on receipt of the instructions, taken from eye level in the light of the diffused afternoon sun, gave no appearance at all of relief to the alleged raised rail. By waiting till night, and taking the photograph from a low view-point by the light from an acetylene cycle-lamp, a result was obtained that exaggerated, if anything, the cyclist's case.

Another case that depended partly on photography was a collision dispute in which the point at issue was which of two cross-roads was the main (or more important) road and entitled to precedence as regards traffic. Here choice of view-point and of suitable focal length of lens were factors essential to helpfulness to one's client. Instances could be multiplied, but lawyers, and especially their clerks, need some tactful education to the effect that a little information as to the points of the case, and the granting of some measure of discretion, may result in greater chances of a win. Legal photography is, in short, not an automatic process any more than portraiture is.—D. C.

Printing from Line Negatives.

It is not too well known that gaslight paper shows marked superiority over bromide for the purpose of printing from line negatives. Not only does the slow paper give a pure black line with greater ease and latitude of exposure and development, but the gaslight class of emulsion has the property of retaining a perfectly clean edge to a line no matter how grossly over-exposed it may be. Bromide paper, on the other hand, irradiates to a slight but noticeable extent on the slightest provocation.

In many line negatives some parts are slightly veiled, and an exposure sufficient to give a good black in these portions would tend to thicken the clearer lines. In gaslight, provided proper contact is secured, this is never the case. Much the same remarks apply to the making of diagram lantern-slides, but here a word of caution is necessary. A negative which has portions showing a distinct veil proves difficult to print on a lantern plate of the gaslight variety without very prolonged exposures. Although the clearer lines do not actually thicken up by spreading any more than in a paper print, halation is very liable to occur owing to the great transparency of the emulsion.—D. C.

The Side-Swing for Field Cameras.

The studio camera, as compared with the instrument for outdoor use, has very few movements, but on the better makes there is one adjustment that it possesses almost exclusively, viz., the side-swing of the back. Yet in outdoor work such a movement is at least as useful as it is in the studio. Perspective views of buildings and cars are only two instances of many that must occur to the mind of any commercial operator.

Many field cameras, merely by reason of the looseness of the sliding pieces connecting the back to the baseboard, permit of a limited amount of side-swing, but if an equally small degree of swing be contrived for the *front* a great power is placed in the photographer's hands in quite a surprising number of subjects. Quite apart from the shortened exposures due to less need for small stops there is in practice a gain in sharpness which is better than that obtained by stopping down. When enlarging, the difference is often very marked.—D. C.

FORTHCOMING EXHIBITIONS.

September 9 to October 7.—London Salon of Photography. Particulars from the Hon. Secretary, London Salon of Photography, 5a, Pall Mall East, London, S.W.1.

September 18 to October 28.—Royal Photographic Society Annual Exhibition. Particulars from the Secretary, Royal Photographic Society, 35, Russell Square, London, W.C.1.

October 18 to 21.—Rotherham Photographic Society. Hon. Secretary, S. G. Liversidge, Orissa, Gerard Road, Rotherham.

October 18 to 28.—Portsmouth Camera Club. Latest dates: Entry forms, October 11; exhibits, October 16. Particulars from the Hon. Secretary, C. C. Davies, 25, Stubbington Avenue, North End, Portsmouth.

1923.

February 5 to March 3.—Northern Photographic Exhibition, City Art Gallery, Manchester. Latest date for entries, January 12. Particulars from the Hon. Exhibition Secretary, Walter Johnson, 30, Hartington Road, Chorlton-cum-Hardy, Manchester.

March 2 to 31.—Pittsburgh Salon of Photography. Latest date, February 5. Secretary, Charles K. Archer, 1,412, Carnegie Building, Pittsburgh, Pa., U.S.A.

March 13 to 16.—Exeter and West of England Photographic Exhibition. Particulars from the Hon. Secretary, Frederic G. Tutton, 9, Union Road, Pennsylvania, Exeter.

March 16 to 24.—Photographic Fair, Holland Park Hall. Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications September 4 to 9:—

Shutters.—No. 24,360. Shutters for photographic cameras. A. J. Dennis, V. W. Edwards, and Houghton-Butcher Manufacturing Co., Ltd.

Colour Photography.—No. 24,214. Colour photography. M. Roth.

Applications, September 11 to 16:—

Cameras.—No. 25,012. Cameras. A. E. Norton.

Photography.—No. 24,940. Photography. W. P. Carpmael (H. C. J. Deeks).

Development.—No. 24,512. Apparatus for development of photographic films. J. H. Jackson.

Plate Storage.—No. 24,663. Box for storage of photographic plates, records, etc. E. H. Masters.

Applications, September 18 to 23.

Cameras.—No. 25,797. Photographic cameras. Optische Anstalt C. P. Goerz Akt.-Ges. and F. Weidert.

Focussing Devices.—No. 25,375. Focussing devices for cameras. P. H. C. Redders and F. Torka.

Camera Stands.—No. 25,119. Photographic camera stand. E. H. Mills.

Colour Photography.—No. 25,565. Production of transparencies in natural colours. L. C. Rudkin.

Colour Cinematography.—No. 25,675. Colour cinematography. D.C.L. Syndicate, Ltd., and F. W. Donisthorpe.

Colour Cinematography.—No. 25,553. Preparation of multi-coloured screens for colour cinematography, etc. G. Frost.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

Composite Plates for Indirect Colour Photography.—No. 183,189 (March 19 1921). The invention describes a process for preparing three separate colour sensitive emulsions, coated on one support in such a way that one exposure is necessary to produce the three negatives. The films may be separated for development, and each film developed as a separate exposure. A glass plate coated with sensitive emulsion is taken as the rigid support, and two thin colour sensitive films are pressed into contact with this by means of rollers.—Ernst August Lage, 162, Wandsbeckerchaussee, Hamburg, Germany. (Further particulars of this process are given on another page in the "Colour Photography" Supplement.

Two Colour Colour Cinematography.—No. 183,150 (November 4, 1921). The invention describes the apparatus necessary for the production of two-colour cinematograph films, in which a disc is utilised having an aperture admitting white light, which has a phase of blue filter attached, and also a section of red filter. The blue filter or phase attached to the aperture admitting white light is intended to increase the colour value on the blue side, and the filter can be varied in area or intensity to suit any particular condition of light or nature of subject. The red filter is graded in depth, and exposure commences through the densest end, the amount of light passing being gradually increased in intensity as the disc moves forward. It is claimed that more perfect blending of colours is obtained by this invention, and that it is now possible to make colour films by normal artificial light.—Roland Oliphant Percy Humphrey, New Hibernia Chambers, London Bridge S.E.1, and Claude Harrison Friese-Greene, 32, Crescent Road, Bromley, Kent.

(Further particulars of this invention are given on another page in the "Colour Photography" Supplement.)

The following complete specifications are open to public inspection before acceptance:—

Colour Cinematography.—No. 185,386. Process and apparatus for making coloured or uncoloured cinematograph pictures and for reproducing cinematograph films. R. H. C. Koumans.

Projection Process.—No. 185,395. Process for diascopic and episcopic projection. E. Liesegang.

Trade Names and Marks.

MARKS PLACED ON THE REGISTER.

The following marks have been placed on the register:—

Kima.—No. 424,732. Scientific instruments included in Class 8. W. Watson & Sons, Ltd., 313, High Holborn, London, W.C.1, manufacturing opticians.

Oro.—No. 424,837. Photographic paper, photographic albums and photographic mounts included in class 39. Thomas Illingworth & Co., Ltd., Cumberland Avenue, Park Royal, Willesden Junction, London, N.W.10.

New Books.

Studio Advertising for Photographers. London: Houghtons, Ltd. 2s. 6d.

While schemes of national advertising of portrait photographs are being talked about, it is nevertheless true that they cannot render altogether unnecessary individual advertising by photographers in their local newspapers. On the contrary, local advertisements form a supplement to any national scheme which may be devised and themselves benefit by the stimulation of public interest which would be created by a general campaign of Press publicity. But, apart from these considerations, a very useful purpose is served by the compilation of typical Press advertisements for photographic studios which Messrs. Houghtons have made and published. The little book contains a score or two of advertisements attractively worded and set up in types which are commonly employed in newspaper offices. Moreover, they are arranged for various sizes and shapes of display, from small panels to be inserted in a 2-inch or a 3-inch column up to larger announcements occupying spaces such as 4½ x 6 inches. It is hardly necessary to say that any of the smaller ones could be set up by a local printer in larger size, and *vice versa*, but as they stand the series represents a very well selected set of announcements from which a photographer can choose according to his fancy. The wordings of the advertisements make use of such inducements as the charm of babies and children, photographs as birthday and Christmas presents, photographs of homes and gardens, animals and motor cars, and sports subjects. They are printed on one side of the paper only, so that the user has simply to tear out a particular announcement along the perforations in order to be provided with the "copy" for his newspaper. One or two of them make use of line illustrations, stereos of which are obtainable from Messrs. Houghtons. We are quite sure that no photographer who does any Press advertising will regret paying half-a-crown for this very useful volume.

L'Indicateur de l'Industrie Photographie. Paris: Paul Montel, 18 francs.

The publishing house directed by M. Paul Montel, 35 Boulevard St. Jacques, Paris, has issued a large book of 390 pages which provides a conspectus of the photographic trade in France and several other Continental countries, and also a directory of professional photographers and dealers in the same regions. It is very clearly divided into definite sections. First come lists of professional photographers in Paris, in the Seine Department, and in the other Departments of France, and in the French Colonies and Dependencies. Similar lists follow of dealers in photographic requisites. There are also directories of professional photographers and dealers in Belgium, Switzerland, Holland, Luxembourg, and a few addresses of presumably French portraitists and dealers in, chiefly, the Latin countries in Europe and South America.

Perhaps the parts of the volume which provide a survey of the manufacturing and wholesaling trade in France are those which will be of chief service to people in the industry in this country. There is first of all a list of the chief goods (apparatus and materials) of the photographic trade with the names and addresses in the case of each of firms who manufacture or supply. This is followed by an alphabetical list of the trade marks of photographic goods, each identified by a brief statement of the nature of the goods themselves to which the mark applies and of the name and address of the supplying firm. This list is by no means limited to French goods. The volume is completed by brief particulars of the various trade associations in France and by a list of the chief French photographic societies. M. Montel is to be congratulated upon having produced a volume which will take its place as a standard work of reference for those having dealings, in the way of photographic trade, with firms or individuals in France.

Eastman Research Laboratory Papers. Rochester, N.Y.: Eastman Kodak Co.

One welcomes the fourth volume of the "Abridged Scientific Publications" which are published by the Research Laboratory of the Eastman Kodak Co. as a somewhat condensed record of the many scientific communications which have been published by the Laboratory. The present volume contains those published during the years 1919 and 1920. These include 34 papers, most of them dealing either with photographic chemistry or with the properties of gelatine. It is a very great convenience for the student of the progress of scientific investigation in photography to have such a periodical official record of the work which has been carried out by Dr. Mees and his collaborators. Moreover, in the present volume the compilers have taken the opportunity of providing several complete indexes to the whole series of 117 papers which have been published since the establishment of the Laboratory. One of these indexes is arranged according to author; a second is one in which the papers are classified according to their subjects, and a third is a chronological list of the communications, giving in each case a reference to the journal in which the full communication was first published. No price is marked on the volume before us; we believe that the Eastman Research Laboratory is ready to send a copy to investigators or students able to make use of it.

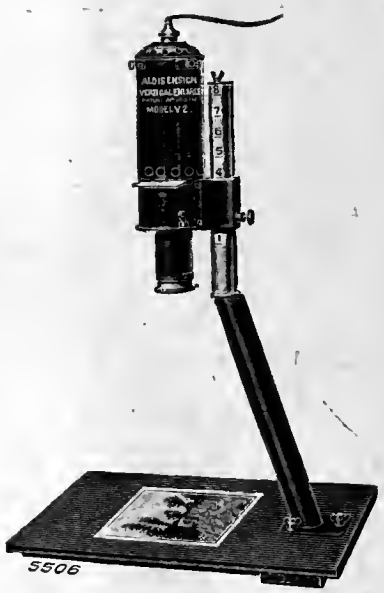
My Five Shilling Camera. By S. N. Sedgwick, M.A. London: Religious Tract Society. 5s. net.

The idea of a course of instruction in the making and use of a photographic equipment in the shape of a series of letters between uncle and nephew is probably an innovation in the planning of a photographic text-book. The present volume takes this form. If we grant the basic assumption that cameras are so dear as to be beyond the means of the father who sends his boy to a boarding-school, well, the arguments of our uncle-author hold good. Perhaps, however, it is not by chance that Mr. Sedgwick makes the uncle a sufferer from malaria, acquired in the East, and therefore liable to take a somewhat jaundiced view of things. Despite the essential wrongness of the assumptions on which the volume is based, there is a good deal to commend in it as regards the practical instruction which it gives in the home-making of a camera, stand, and enlarging camera. These appliances, of course, are of the most primitive kind. No doubt there are boys who will find enjoyment in making them and would not be added to the ranks of amateur photographers but for travelling along this channel. But such must surely be very few in number.

New Apparatus.

Aldis-Ensign Vertical Enlarger. Sold by Houghtons, Ltd., 88-89, High Holborn, London, W.C.2.

THE apparatus available for enlarging nowadays has undergone a complete change and, from the old horizontal type of lantern, has become a compact, easily adjusted vertical model. This



Aldis-Ensign Vertical Enlarger Adjustable Model.

type of enlarger is gaining rapidly in favour, owing principally to the simplicity of its construction and the ease with which it can be worked. It is no longer necessary for a separate

easel to be used, this necessary part now being formed in the base-board of the apparatus, making the unit quite complete in itself. The Aldis-Ensign vertical enlarger, which has just been placed upon the market by Messrs. Houghtons, is the latest addition to this type. It consists of a tubular body attached to an upright brass rod, which is firmly fixed to the base-board. The body of the lantern, which is strongly made in metal, contains a "diffusing" condenser above which is placed the illuminant, which can be either electric or incandescent gas. The makers emphasise the fact that these are the only patterns of vertical enlarger fitted with condensers, and thus permitting the shorter exposures characteristic of this system of illumination. The metal body slides on the brass rod, on which are engraved numbers from 1 to 8, which numbers are repeated upon the lens tube. By fixing the body of the lantern to, say, figure 8 and the lens tube also to the same number, a perfectly sharp picture is given upon the base-board. The size of the picture may therefore be adjusted to requirements by simply fixing the body and the lens tube at similar numbers. An additional advantage of the Aldis-Ensign vertical enlarger is the enclosed orange cap, which is placed on or off by moving a lever fitted on the outside of the lantern body. The V2 type enlarger is made to take 3¼ × 2¼ film or a large portion of a ½ plate, and is supplied with a folding

Aldis-Ensign Vertical Enlarger Fixed Focus Model.

glass carrier, which enables the film to be kept quite flat. The full enlargement obtainable by this model is 14 in. × 10 in., and the price complete, fitted for gas or electric light, and with an Aldis Plano f 7.7 Anastigmat, is £7 17s. 6d. The electric lamp required is a 60-watt gas filled bulb, of the short pattern now in general use. The lamp for electric and the mantle for gas are not included in the outfit, owing to the difficulty of transport.

Two other types of the enlarger are supplied. The F1 model is of fixed focus, and admits of postcard enlargements being made from V.P.K. or No. 1 Ensignette films. Its price complete, but without electric lamp or gas mantle, is £2 12s. 6d. For enlarging to 6½ × 4½ there is the F2 model. This also is of fixed focus, and takes film of 3¼ × 2¼ size or portions of ½-plates; the price of this model is £3 3s. All three enlargers are focussed at the Aldis optical works, and this fact, coupled with the excellent name Messrs. Houghtons have for photographic apparatus of all kinds, must recommend the new Aldis-Ensign enlargers to all photographers.

More Camera Smuggling.—At the Dover Police Court last Thursday a man was fined £70 for smuggling a camera, films, etc., from Belgium.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Monday, October 9.

Bradford Phot. Soc. "Switzerland: Glimpses of its Mountains and Architecture." J. R. Wigfull.
City of London and Cripplegate P.S. "The Man Behind the Camera." C. Pollard Crowther.
Dewsbury Phot. Soc. "India." J. C. North.
Edinburgh Phot. Soc. (October 9-16). Exhibition of Portfolio Prints.
Southampton C.C. "The Country of the Seven Valleys." M. O. Deil.

Tuesday, October 10.

Birmingham Phot. Soc. "The Development of the Castle." Harold Baker.
Cambridge Phot. Club. "Norway." Rev. E. G. Alderson.
Exeter Camera Club. "The Way of the Lovely Sky." A. G. Buckham.
Manchester Amateur P.S. "Amateur Photographer" Prize Slides.
Morley Amateur Phot. Soc. Whist Drive.
South Glasgow C.C. Social Evening.

Wednesday, October 11.

Croydon Camera Club. House exhibition.
Partick C.C. "The Western Isles." A. M'Phail.

Thursday, October 12.

Hammersmith Hampshire House Phot. Soc. "The Birthplace of Perpendicular Architecture." C. Harvey Piper.
Letchworth Camera Club. "The Most Picturesque Place in the World." Fitzwalter Wray.

Saturday, October 14.

Morley Amateur Phot. Soc. (October 14-17). Exhibition of Y.P.U. Trophy Prints.

CROYDON CAMERA CLUB.

Mr. Vivian Jobling gave a capital lecture-demonstration on "Paints, Varnishes and Cements," much of photographic application. He certainly objected to the secretary having inserted the last item, and concluded it was done in the vain hope of recovering lost youth. The practical usefulness of the lecture is indicated by the following account (comprising only the major part) which has been written in staccato fashion for brevity's sake.

He started with a short reference to ordinary paints and the various brushes used in their application. The best way to clean them, he said, is to rinse well in turpentine and then wash in warm soap and water. Turpentine alone, more or less, leaves the brush stiff. Benzol (not petrol) makes a good and cheap substitute. He strongly advised that all paints and varnishes should be purchased in fair quantities from a reputable warehouse (avoiding the luncheon hour) such as Farmiloe's in Rochester Row, Westminster. Buying anywhere in small tins and bottles is a more expensive proceeding.

Aluminium paint is, he said, very useful for many purposes, and he was surprised it was not more largely used. It has excellent covering power, dries quickly, withstands weather well, and is first-rate for coating iron pipes, washing tanks, etc. Also, the paint has the peculiar property of rendering objects visible in the dim light of the dark room. Splendid, too, for rough wood frames, as the coating dries with a pleasing matt-silver lustre.

Mr. Merritt stated he made this paint by dissolving a stripped 5 by 4 Eastman portrait film in 2 ozs. of amyl acetate, adding powdered aluminium q.s. The paints stood almost up to red heat.

Berlin black has not the resisting properties of aluminium paint, but possesses many good qualities, and is cheap. Covers well, dries rapidly, and as a base for copal varnish gives a capital enamel effect. On iron work a charming egg shell finish is obtained. An accidental application of the black to the table cloth by Mr. Jobling drew from the secretary an adverse opinion as to its suitability for this purpose.

Bath enamel in photographic practice is useful for coating developing dishes. He had found two or three coats will withstand strongly alkaline developers.

Black Japan differs from Berlin black in containing a soluble bitumen instead of fine black powder in suspension. On metal it dries with a surface like glass and adheres well. Excellent for dark-lamps and projection lanterns as it will withstand considerable heat. The lecturer said he had known solder run down under-

neath it. When first heated the burnt smell is not attractive, but it soon wears off

For a dark walnut stain for wood, dilute the Japan with an equal bulk of turpentine. So diluted is ideal for picture frames and staining floors, as the solution penetrates well into the wood without raising the grain. For "fumed" oak the mixture is slopped on anyhow, allowed to remain from 5 to 10 minutes, according to temperature and hardness of the wood, and then wiped off with a rag so far as possible.

For thick celluloid varnish, dissolve 15 grains of celluloid clippings in one ounce of amyl acetate. Beyond 15 grains the varnish gets too thick to use conveniently. A 10-grain solution is a more useful strength. The formula in the B. J. Almanac, including acetone, had not worked well in his hands as it dried matt. Brushes are best washed in acetone, followed by methylated spirits. The addition of a little oil of lavender renders the smell less objectionable. "Nothing like the stink," confirmed Mr. Sellors after comparative nasal tests.

Mr. Purkis said the matt surface on drying was probably due to the use of commercial acetone. This can be avoided by employing the anhydrous acetone, which, however, is expensive.

Mr. Wratten mentioned the adaptability of thin celluloid varnish to coating surface silvered mirrors to preserve their lustre. Mr. Hibbert pointed out that if the varnish is too thin diffraction colours form. Dealing with the limit of 15 grains to the ounce, he said that the addition of acetone and sulphuric ether permitted more celluloid to be dissolved for equal viscosity.

For black celluloid varnish, dissolve 5 grains of "spirit black" powder (usual trade term) in 2 ozs. of clear celluloid varnish. Two or more coatings are necessary, those following the first coating to be applied quickly.

For the finest finish, copal varnish is compulsory, and it is very false economy to buy any but the best. The paint or enamel to be treated is rubbed down with pumice powder on moistened felt, and the varnish applied with a flat hog's-hair brush. For super-polish the felt is employed dry. If necessary, the varnish can be thinned with American (not Russian) turpentine.

Shellac varnish is very useful in photographic practice as it has no action on dry plates or sensitive papers. A normal solution contains 20 per cent. of orange shellac flakes in methylated spirits. Dilute with equal bulk of spirit for use as a lacquer. Mixed with ivory black (many recommend vegetable black) the normal solution affords a good dead black. A glossy black is secured by mixing one part of "spirit black" powder in 100 parts of the varnish—handy for touching up small metal parts. Shellac varnishes are unaffected by petrol or benzol.

A formula for white shellac varnish is :—

White shellac, crushed and dried	1 oz.
Sandarac	1 oz.
Venice turpentine	1 oz.
Methylated spirits	6 ozs.

For negative varnish, dilute with equal bulk of spirit and flow on warmed negative.

Mr. Jobling said he was able to publish for the first time an old and well-tried recipe for rough hands and faces, which he called the 'maiden's blush." It is as follows :—Powdered gum tragacanth, 1 dram; zinc oxide (pure), 1 oz.; liquid cochineal, 40 minims (this is the "maiden's blush" part); glycerine, 4 ozs.; oil of lavender, 20 minims; water, 7 ozs.

Mix the gum with a little of the glycerine into a smooth paste, and then add the oxide with more glycerine, incorporating thoroughly before adding the rest of the ingredients. Apply sparingly after washing.

An attempt by Mr. Jobling to beautify Mr. Sellors with this elegant cosmetic was successfully repulsed. A contest then sprang up between them as to the rival merits of cork lino and linoleum as a waterproof table covering. On the authority of each in turn it was interesting to learn that the other was past praying for in the matter of intelligence. A most hearty vote of thanks was accorded Mr. Jobling, and well he deserved it.

Edinburgh Society of Professional Photographers.—Mr. Lawrence, of Messrs. Kodak, Ltd., delivered a most instructive lecture on Tuesday in last week to an audience of over seventy people, professional photographers, in Edinburgh, Perth, Kelso, Dundee, Bridge-of-Allan, and elsewhere. The lecturer spoke on Eastman Portrait Films, and maintained the superiority of that film over glass plates. He stated that the opposition to the change from glass plates to the film was often due to ignorance and the superseding of old methods more than to anything else, and only required some acquaintance with the actual results of the film to turn it into appreciation. He referred not only to the saving of labour and costs, but also to the finer quality of the work obtained from the use of the film instead of glass plates. In speaking on the subject of spot lighting, or subsidiary lighting, as he preferred to call it, Mr. Lawrence advocated the use of restraint in subsidiary lighting and deprecated its use towards the development of "freakish" photography. The lecturer exposed several films and gave demonstrations showing the better results to be obtained from the subsidiary lighting and how it should be used. He also referred to the diffusion discs, which he said could be used to great advantage by photographers. At the conclusion of the lecture Mr. Lawrence received a very hearty vote of thanks, and the thanks of the meeting were also conveyed to Mr. J. Campbell Harper for the use of his studio for the lecture.

News and Notes.

Ensign Photographic Diary.—This handy little book, measuring only 3½ ins. by 2 ins., has been issued by Messrs. Houghtons, Ltd., of 88-89, High Holborn, W.C.1. Much useful information, together with several pages of handy tables, is included, and there is ample space for the recording of exposures. A diary section and cash pages with an ingenious calendar covering three years are also features. The diary is priced at 1s., and is obtainable from all the usual dealers.

Ensign Indoor Competition.—With a view to encouraging amateur photography during the winter months, Messrs. Houghtons, Ltd., are offering £50 in prizes for the best photograph taken in the home from negatives made with Ensign plate or film cameras. The first prize is £25. An attractive window bill has been issued to dealers, and supplies of it, together with counter leaflets and entry forms, may be obtained on application. The competition closes on December 30.

Summer Time to End.—The Home Secretary gives notice that Summer Time will cease and normal time will be restored at 3 a.m. (Summer Time) in the morning of Sunday next, October 8, when the clock will be put back to 2 a.m. The hour 2-3 a.m. Summer Time will thus be followed by the hour 2-3 a.m. Greenwich Time. All railway clocks and clocks in post-offices and Government establishments will be put back one hour, and the Government requests the public to put back the time of all clocks and watches by one hour during the night of Saturday-Sunday.

Portraits in a Hurry.—A writer in the "Yorkshire Observer" deals in a humorous manner with the taking of portraits for passports. "Quite a brisk business is being done," he writes, "Briskness, indeed, characterises the affair throughout. There is no time for nice posing, or for summoning up one's most winning smile. It is a grim, business-like transaction from beginning to end. One pays one's money—half-a-crown for six—and one has no choice. 'Keep quite still,' rasps out the photographer—like a company sergeant-major—'look straight at the lens!' Click, 'Thank you very much. Call to-morrow at two.' It is an object-lesson in precision. If only all photographs could be taken like that! How do they come out? Well, if the scrutinising officials can bear the shock, the victims can. And what does it matter, so long as one gets abroad?"

Autumn and Winter Photography.—A 48-page booklet entitled "Autumn and Winter Photography" and written by Mr. W. L. F. Wastell, has been issued by Messrs. Houghtons for sale at the price of 3d. It describes a large number of the accessories with the aid of which the amateur worker may conveniently add to his enjoyment during the winter months. Mr. Wastell discourses interestingly on these many specialties, turning from the storage of negatives to the use of flashlight, and so on, and nevertheless contriving to give a number of practical hints. The booklet is well illustrated, and is supplied to dealers in lots ranging from 100 to 1,000 copies with the dealer's imprint on the front cover at prices from 15s. to £5 5s. On the last page is described a bisecting rule for the central mounting of prints, which appears to be identical in principle with that which was the subject of an article contributed to our pages by Mr. Vivian Jobling on October 24, 1919.

COOKE LENSES.—Messrs. Taylor, Taylor and Hobson, 74, Newman Street, London, W.1, have issued a new catalogue of Cooke lenses, which is a good deal more than a mere price list, since it contains a number of pages of hints on the preservation of lenses, causes of defective definition due to the camera, and some notes (quoted) on depth of focus. The latter, it must be pointed out, are a very partial treatment of this question, and, in view of the fact that in much photography depth depends solely on the actual diameter of the diaphragm, and has nothing to do with the focal length of the lens, it must be somewhat confusing to the optically uninformed amateur to be told that the hyperfocal distance depends entirely on the focal length of the lens. The subject is further confused by calling the hyperfocal distance the "infinity point," a term which must surely offend even those with a crude sense of the fitness of words. However, Messrs. Taylor, Taylor and Hobson's own particulars of the various types of Cooke lens which they catalogue do in fact correct any misconceptions which may arise from these special notes. The list is one which the would-be possessor of a lens of the highest class should certainly possess. It is obtainable free on application.

LOW-STRENGTH HYPO.—Mr. W. G. F. Woodcock, general manager of the Association of British Chemical Manufacturers, writes:—It has come to the knowledge of the Council of the Association of British Chemical Manufacturers, that, following the decision of the Referee in the recent case under the Safeguarding of Industries Act, several parcels of hyposulphite of soda "pea" crystals have been imported into U.K. ports, which are of lower percentage than usual in respect of crystallised hyposulphite of soda. These low strength "pea" crystals of foreign origin will no doubt find their way on to the market, and so into the hands of consumers for photographic purposes, who will thus be receiving hyposulphite of soda of a lower test than that to which they have previously been accustomed. In bringing this matter under the notice of buyers of hyposulphite of soda for photographic purposes, this Association desires to add that ample supplies are available of hyposulphite of soda of *British* manufacture, of the highest possible quality, and of high test. It, therefore, urges buyers when making purchases, to stipulate for a British-made product. If any buyer should have difficulty in obtaining supplies of a British make, and will communicate with this Association, full particulars will immediately be furnished as to where supplies may be obtained.

PHOTOGRAPHIC SENSITOMETRY AND TESTING.—The Washington Government Printing Office has issued No. 439 of the Scientific Papers of the Bureau of Standards on the "Sensitometry of Photographic Emulsions and a Survey of the Characteristics of Plates and Films of American Manufacture," by Raymond Davis and F. M. Walters, Jun. For several years the Bureau of Standards has made measurements of the characteristics of photographic light-sensitive materials, aiming at uniformity in the standardisation of methods, so that the results by various workers may be directly comparable. The present paper (according to a notice in "Nature") gives details of the principles involved in photographic sensitometry and testing generally as introduced by Hurter and Driffield and published over and over again during the last thirty years. Perhaps it is desirable to restate them to render the paper more complete. The methods of the Bureau are more original. Their light-source is a 6 to 8 volt Mazda C automobile-headlight with a special blue glass filter, giving 2.73 candle-power and the colour of average yearly noon sunlight at the latitude of Washington. The principal other deviation from H. and D. methods is that the Bureau of Standards defines the speed of a plate as 10 divided by the inertia, instead of .34 divided by the inertia as adopted by Hurter and Driffield to fit in with their actinometer. For colour sensitometry a replica grating is used with a slit 2 ins. long, and the exposure is graduated by a disc with suitably curved apertures that is rotated close in front of the slit. The methods of making other tests are fully described. Appended are 86 charts, each dealing with a single plate and giving three characteristic curves representing the result of development for 3, 6 and 12 minutes respectively, a contrast development curve, a fog contrast curve, the fog being exclusive of the glass and gelatine, a spectrogram showing colour sensitiveness, exposure factors for several colour filters, speed, extent of the straight part of the characteristic curve, and the resolving power estimated by a standardised method. Only sensitive materials made in the United States, and practically all of these, are discussed

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

PHOTOGRAPHERS AND APPRENTICES.

To the Editors.

Gentlemen,—Our attention has been drawn to a statement on the back of the current prospectus of our evening classes in photography which may be read to imply a sweeping condemnation of professional photographers in their dealings with apprentices.

The unfortunate misplacement of a comma has converted a statement of the fact that *some* photographers do take undue advantage of the apprentices in their service, into one that may be read to mean that *all* photographers do so.

Obviously this was never our intention, and we ask you, therefore, to publish this disclaimer in fairness to the profession.—Yours faithfully, on behalf of the Polytechnic School of Photography,

ALBERT J. LYNDON,
Head of Department.

School of Photography,
309, Regent Street, W.1., September 28.

THE 1923 P.P.A. CONGRESS.

To the Editors.

Gentlemen,—The number of members registered at this year's Congress of the P.P.A. is reported to be 292, out of a membership of over 1,000. This, after the special booming this Congress has had, cannot be considered satisfactory, even after allowing for the effects of the slump in trade; and I think the poor attendance was due to the fact that September is a most unsuitable month for a professional photographers' congress. In the past I have been a regular attendant, usually staying in town for the full programme, but this year to my great regret I was unable to be present, and I feel sure I was one among many who found it impossible to leave their businesses at this time of the year.

For a number of reasons, such as the return from the holidays, children going back to school, the commencement of the Christmas trade, etc., a revival of trade takes place every year in September in the studios of the ordinary provincial photographer. The present bad year even has been no exception to this rule.

In my own studio I did more business in the week before the Congress than in any week in the preceding five months, and to leave one's business for several days at such a time, even for a congress, is both difficult and unwise. There is no need to point out the unsuitability of September for the seaside photographer, but it needs emphasis that the busy season for the majority of inland provincial photographers is from September to Christmas.

And now, gentlemen, it seems probable next year will again see a September Congress. No protest has been made; no protest will be made, for we are an undemonstrative lot! We shall again be unable to go. But that is not for our own welfare, or the welfare of the Association. The duty of the Council is plain. Before a September congress is again decided upon, a referendum should be taken through the post of all the members of the Association, asking them to state the month in which it would be most convenient for them to attend the Congress. A £5 note would cover the cost of this; all interested would vote on such a vital matter to them, and the question settled once and for all. The Council are out of touch with the ordinary member in this matter, but as business men they would see the advantages that would accrue from carrying out the wishes of the majority as recorded in the vote. My own personal opinion is that such a referendum would show a large majority for a month in spring, either March, April, or May.

One other point. A large number of professional photographers are dealers nowadays, and when the Congress and the Photographic Fair are held simultaneously (not necessarily in the same building) they benefit by the one journey to town serving for both functions. This must tend to increase the attendance at the Congress.—Yours faithfully,

JAMES SPEIGHT.

The Studio,
Sutton Coldfield, Birmingham.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

J. W.—Ordinary blacklead or stumping crayon is the material used for backgrounds on negatives. It is applied with paper or leather stumps. A *very soft* lead pencil may be used for fine details. You would probably do better if you got a "Billdup" outfit, as you can judge better what you are doing than with matt varnish.

B. P.—(1) Your trouble is probably caused by the light being too far from the condenser. Put the lamp up to, say, 6 inches from the condenser, and note if you get a better covering power using the 7½-inch or 8½-inch focus lens. We should advise that the condenser be altered back to its original spacing, and a ground glass diffuser used between it and the light. (2) The system for carrying a large number of plates is the Mackenzie-Wishart, in which the plates are carried in loose envelopes. The envelopes are quite light-tight, and are very light in weight.

R. B.—Your trouble appears to be due to the small amount of light you have available. The three 1,000 c.p. lamps you have on the right-hand side of your studio should be altered to two of 2,000 c.p. each, and the third one replaced by a standard lamp of 3,000 c.p. This could be moved about the studio and placed in any position as required. On the left side the light should be increased to 2,000 c.p., and the lamp so fitted as to allow of its use on the floor level if necessary. We should also suggest that you have a raised platform for your sitters, say 1 ft. from floor, to enable you to get a slightly lower camera level, your present level appearing too high. Diffusers should be provided for the lamps, and a large white moveable reflector placed near the door leading to the studio from the front shop. You do not seem to be getting good covering power with your lens, the feet of your sitters appearing other than sharp. The extra light may allow you to stop down a little and so perhaps correct this.

R. N.—We referred your query to Mr. R. P. Rudd, the author of the article, who replies as follows:—The "H" type is one of the two kinds of reflectors supplied by Messrs. W. J. Bartholomew & Co., 40, Gerrard Street, London, W.1., and which they recommend for use in small studios. Mainly, I use the reflected light from the angle formed by the screen (J) and the wall (K) and the corner of the ceiling, but I attempt and secure any form of lighting required at will simply by moving the lamp and reflector to the desired position. When "in situ" the distance required from lamp to secondary reflecting surface can easily be judged, care being taken that the Barkay reflector be properly focussed with the light from the half-watt 1,500 c.p. lamp. I use various distances from 18 inches up to 3 feet away from secondary reflecting surface, but there is no hard and fast rule. I alter it to secure the best lighting in the subject of the moment. Sometimes it is up in the corner near the ceiling, at other times down to within 4 feet of the floor for small children.

G. S.—Under the Electric Lighting Acts, both supply corporations and municipal authorities are given very considerable powers, and as the recent case of the Westminster company ("B. J.," May 26, 1922) showed, it is quite open for a company or undertaking to charge anything they like for current up to a certain maximum; that is to say, they need not charge everybody the same power rate, even if they admit that they are entitled to have current at a power rate. But what they are usually prevented from doing is the showing of undue preference between different consumers. We advise you to find out, if you can, consumers who are getting the power rate and are using the current pretty much in the same way that you are as regards total amount and intermittency of use. Never mind whether they are photographers or not. You aim must be to show that one consumer is being given preference over another, and if you can show that you stand a pretty good chance of compelling the people to supply you at the most advantageous power rate. You should look through the judgment in the Westminster case, and the article which we wrote upon it, as already referred to above.

K. W.—We certainly agree with you that it is best to rely entirely upon electricity, as your windows are too small to have much effect. The lamps you mention are quite good, but we should advise you to have separate diffusers on small stands. We think the candle power of your lamps should also be increased to allow of the short exposures necessary for children, and would suggest that one, two and three be 2,000 c.p. each and four and five 3,000 each. One hanging indirect pendant in about the centre of the studio with a lamp of 2,000 c.p. would be a great help. Your floor could be covered with felt, which is of smoother surface than carpet, and would take up the inequalities of the floor boards. Lamps 4 and 5 should be on standards, as the General Electric Company's No. F.A.6,201, and provided with focussing resistance, which allow of over-running the lamps. The lamps would be of a lower voltage than your supply, and would only be overrun during the actual exposure. Small separate diffusers should be supplied for these, while one larger diffusing screen would do for lamps one, two and three. The booklet supplied by the General Electric Co., Ltd., Magnet House, Kingsway, London, W.C.2, on studio lighting, would be of interest to you.

S. B.—The cameras for while-you-wait ferrotype or card portraits are of rather an elaborate type, as they contain a changing device for bringing, frequently, 50 cards or plates successively into position for exposure and also provide for developing in daylight. As some of the cameras are not expensive, we think your best course would be to apply to Messrs. Jonathan Fallowfield, Ltd., 146, Charing Cross Road, London, W.C.2, who supply all makes on the market. An ordinary lens is used. The following is a formula for the combined developing and fixing bath:—

Water, to make	40 ozs. fluid.
Hydroquinone	½ oz.
Soda sulphite	4 ozs.
Soda carbonate	4 ozs.
Hypo.	8 ozs.
Liq. ammonia .880	2 fl. ozs.

Addition of more ammonia to the developer gives more vigour. The plates develop (and partly fix) in two or three minutes. They can then be examined in daylight and fixed in plain hypo. You really make a negative by the process, but as it is on a black surface, and as the developer produces a whitish coloured image, the effect obtained is that of a positive.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3258. Vol. LXIX. FRIDAY, OCTOBER 13, 1922. Price Fourpence.

Contents.

SUMMARY.

A leading article is recommended to the study of employers and assistants in photographic establishments for the sake of the general sense which it aims to convey of the legal relations which exist between master and servant under common law. The present series of notes, dealing chiefly with the establishment of this relationship of employer and employed, will be followed by another in which the writer will consider more particularly the legal aspect of conditions of service and the severance of the relationship. (P. 614.)

At a recent congress of the Photographers' Association of America Mr. H. Wills read a paper containing a wealth of practical information on the making of good portrait negatives. His hints ranged from the provision of screening and reflecting appliances in the studio to efficient arrangements in the dark-room and in the mixing of photographic solutions. (P. 617.)

In the present issue Mr. J. Effel resumes his talks on the work of a portraitist in the studio, and has some good advice to give on the part which a sense of psychology should play in photographic portraiture. (P. 615.)

Several correspondents urge upon the Professional Photographers' Association the desirability of holding next year's Congress at the same time as the Photographic Fair. (P. 627.)

Renewals of half-watt lamps are an advisable precaution at the present time of year, and may be done at less expense than hitherto. (P. 613.)

Some hints on the lighting of sitters against white backgrounds in the making of portraits in the shadow-profile style are given by a contributor in an article on page 620.

A suggestion in the manipulation of studio blinds and hints on the copying of line drawings are given in contributors to "Assistants' Notes." (P. 621.)

At the Royal Photographic Society on Tuesday evening last Dr. Reginald S. Clay delivered the twenty-fifth Traill Taylor Memorial lecture, where he made a highly condensed review of the development of the photographic lens. (P. 624.)

The Photographic Golfing Society had a most enjoyable autumn meeting at West Runton, Norfolk, last week. A group of those who attended, among them many leading members of the photographic trade, is reproduced on page 626.

The Northern exhibition is to be held in the City Art Gallery, Manchester, from February 5 to March 3. (P. 626.)

Although often attributed to the late Major-General James Waterhouse, the form of lens stop long used under this name was the invention of a John Waterhouse, who published a description of it in 1858. (P. 613.)

EX CATHEDRA.

The Life of Half-Watt Lamps.

The falling leaves give us warning that the artificial light season is again upon us, and that it is well to see that the installation which has done good service in the past is given a fair chance for the immediate future. Much will depend upon the amount of work which has been exacted from the lamps, but if they have been in constant use it is very probable that a considerable loss of actinic power has occurred. Even if indistinguishable to the eye, a slight deposit on the globe will cause a yellowness of the light, and this can only be detected by comparison with a fresh bulb. A test may be made with an ordinary Watkins meter, or, what is more satisfactory, comparative exposures may be given with a fresh and a used bulb respectively. It is very satisfactory to note that a considerable reduction has just been made in the price of half-watt lamps, so that it will not be a serious matter to provide the necessary renewals. When a number of lamps are in use it is a good plan to change them round from time to time, as there are usually two or three which get more work than the others.

* * *

The Waterhouse Stop.

It would appear that the name of the lately deceased Major-General Waterhouse is associated in the minds of many people with the particular but now largely obsolete pattern of lens diaphragm which for half a century and more went by the name of "Waterhouse." As a matter of fact, however, General Waterhouse had nothing to do with it. Those who take an interest in the origin of the appliances or processes of photography may be invited to turn to the "Journal" of what is now the Royal Photographic Society for the year 1857-8 on page 258 of which they will find the first description of this form of diaphragm in a letter written by John Waterhouse, of Wellhead, Halifax, on July 1, 1858. The writer begins by pointing out the advantage of inserting a diaphragm between the lenses of a portrait objective instead of applying a stop to the front of the lens as had been hitherto done. He proceeds to describe the cutting of a slit in the lens' tube and the insertion therein of a thin metal plate in which is a circular aperture of any required size. Except for the small projecting piece, which in later years was marked with the F. No., this original Waterhouse stop was identical with those which throughout a long period of years were fitted to lenses, until the greater convenience of the iris diaphragm caused them to fall into disuse. We are afraid we must plead ignorance of any further details of the life of this inventor of a universally employed photographic accessory. Perhaps some of our readers of the older generation can tell us something of John Waterhouse. In this connection it is interesting to note that in the library of the Patent Office is a volume of MS. notes and cuttings collected by

"J. W." prior to the year 1859. It is possible—and we have the idea that this view is taken by the Patent Office librarians—that this "J. W." is identical with the John Waterhouse who gave his name to the diaphragm.

* * *

Vertical Enlargers. The ease with which the self-focussing vertical enlargers can be manipulated must cause many would-be users to look with envy on the full-size installations of this pattern. While smaller and less expensive models are now available, including a condenser pattern by Messrs. Houghtons, there are, however, ways by which many of the advantages of a vertical enlarger may be secured by those who possess lanterns of the ordinary pattern. If fitted with a condenser, the latter should be retained, but as a rule it is better to discard the clumsy lamp house and to instal a light tin or iron box to carry the light, which may be incandescent, electric, half-watt, if possible, or gas, the inverted mantle being excellent. A sheet of finely-ground glass should be placed close to the condenser. This will almost obviate the necessity for adjusting the light. A couple of grooved runners should be fixed to the wall, and between these a frame to carry the lantern (which will, of course, have the lens pointing down) at the distance of about one foot from the wall. The whole is now suspended by cords and weights similar to a window sash. A table beneath completes the outfit. Focussing may be simplified by fixing a scale on one of the runners, which will give the total distance between negative and paper for various degrees of enlargement. The negative being set opposite to one of these, and focussing done in the ordinary way, the image will be the desired size.

SOME NOTES ON THE LAW OF MASTER AND SERVANT.—I.

With the possible exception of matrimony there is no relation more common than that of master or servant, nor is there one which in its legal bearings is less generally understood. Since questions depending on this well-defined legal relation constantly arise in the dealings of photographic assistants with their employers, it may be of advantage to attempt a bird's-eye view, so to speak, of the law of the subject. Within the limits of an article of this nature it is, of course, almost impossible to deal with particular cases or problems, but it has been the writer's aim to convey the general sense by which a lawyer is guided in forming an opinion of any concrete dispute. In these democratic days he should apologise in advance for the constant use of such undemocratic expressions as "master" and "servant." He speaks, however, in the language of the law, which delights in such crude but simple terms. After all, the words are, perhaps, less likely to lead to confusion in the minds of the reader (and of the compositor) than their more modern counterparts "employer" and "employee."

To arrive at a due understanding of the important relationship of master and servant, it is, perhaps, advisable to distinguish it from the somewhat similar relationship existing between a principal and his agent, for it by no means follows that the legal principles which govern the relations between a master and his servant are equally applicable to principal and agent. The true distinction between the two cases is that a principal merely directs what work is to be performed by his agent, but has no control over the method by which the work is done, while a master not only orders the work to be done, but has the right to direct how it shall be done.

For instance, a London photographer, who visits a country town for professional purposes once a week, and who arranges that a local stationer shall book orders for him on a commission basis and expend a specified sum provided by the photographer in advertisements, is a principal in the transaction, and the stationer, who is left a free hand as to the methods to be employed in securing orders, is his agent. If, however, the photographer opens a studio in the country town and places a salaried manager in charge of it, the relation between him and the manager is that of master and servant. All such employees as studio operators, printers or receptionists are "servants" within the legal meaning of that term, and their employment is governed by the principles which this article endeavours to elucidate.

Even where it is clear that the relationship is not that of principal and agent it does not always follow that the position of the parties is that of master and servant, since, in some cases, and particularly those in which the remuneration varies with the profits of the business, there may be some evidence of a partnership. There is no very satisfactory general test which can be applied to such a case, the precise legal relationship of the parties depending upon their intention as gathered from their acts and all the surrounding circumstances. It is provided by the Partnership Act, 1890, that the receipt by a person of a share of the profits of a business is *prima facie* evidence of the existence of a partnership between him and the other persons who share the profits, but that the remuneration of a servant by giving him a share of the profits does not by itself make him a partner. It follows then that if, apart from the fact of an employee receiving a share of the profits, he would be only a servant, something more than the payment to him of such share (for example, the acquiescence of the proprietor of the business in his engaging or dismissing servants or entering into business transactions) is necessary to establish evidence of a partnership, while the fact of his receiving a fixed salary in addition to a share of the profits is strong evidence against the existence of a partnership. The payment to a person employed in a business of a commission on business introduced by him would not in itself constitute him a partner.

The relationship of master and servant is created with the greatest ease. With the one exception mentioned below, no formality is necessary; a mere agreement (either verbal or written) by one person to employ and by the other person to be employed is sufficient and, even in the absence of an express agreement, the law can imply the relationship, from the fact that some person is found to be working for another with the latter's consent. In one case, however, namely, where the relationship is intended to continue for more than one year from the date of its creation, an Act of Parliament passed in the reign of Charles II., and known as the Statute of Frauds (a measure designed for the prevention of fraud which was once stigmatised by a very eminent Judicial authority as being more conducive to fraudulent practices than any other legislative enactment) requires it to be evidenced by a written document signed by the party whom it is sought to hold to the agreement. For instance, an agreement for the employment of a servant for two years, or an agreement made in January for the employment of a servant for six months from the 1st October (which will consequently continue for more than one year from the date in January on which it is entered into) will not be binding on any person who has not signed a written memorandum of it, but if one of the parties signs and the other does not (as if, for instance, an offer of employment contained in a letter written by the employer is accepted by the employee verbally), the agreement may be enforced against the

one who signs but not against the other. The memorandum of the agreement need not be a formal document, so long as it contains all the terms, and it may consist of a letter or a series of letters. The memorandum should either be signed across a sixpenny adhesive stamp or presented at Somerset House for stamping within fourteen days after signature, or, in the case of the memorandum consisting of a series of letters, within fourteen days of the date of the last of such letters. The absence of a stamp does not render the agreement invalid as is popularly supposed. The only effect of failure to stamp a document is that in any legal proceedings arising out of it the document cannot be given in evidence without paying the proper stamp duty and a penalty, which is usually £10.

Whether the agreement for employment is written or verbal the law will always read into it any well-established general custom of the business to which it relates, unless the application of that custom is expressly excluded by the terms of the agreement.

Even an agreement with an infant (that is, a person under the age of 21 years) will be binding on him if it is for his benefit. The question whether an agreement is for an infant's benefit is one of fact depending on the particular circumstances of each case, but, speaking generally, it may be said that if an infant employee agrees to give his services in return for a fair rate of remuneration the agreement will be binding on him, and not liable to be repudiated by him under the general principle that an infant is without legal capacity to enter into contracts.

In common with most other human enterprises a contract of service is more easily entered into than terminated. In the ordinary course the employment is deemed to be for a year, and, if it continues beyond the end of the first year, to run from year to year, although the wages may be paid at more frequent intervals than a year, and in such a case the employment can only be terminated by either party at the end of a year of service, in the absence of some express agreement or well-established custom of the trade to the contrary. If, however, the wages are expressed to be so much per week or per month or per other period less than a year, this circumstance is sufficient to take the case out of the ordinary rule, and the employment may then be terminated at any time by reasonable notice on either side. Numerous decisions (some of them by no means easy to reconcile) have been given by the Courts on the question of what constitutes reasonable notice, and from these there may be deduced the sound working rule that persons in responsible positions, such as managers, must receive or give not less than three months' notice, while one month will suffice in the case of assistants or clerks. The notice need not be so timed as to expire at the end of a calendar month, and, in the case of a servant whose employment can be terminated by a week's notice, the notice can be given on any day of the working week. Questions sometimes arise as to what notice is necessary where a servant is engaged on a month's or four weeks' trial, the salary being paid weekly. It is clear that in such a case the engagement is for a definite period of one month or four weeks only (as the case may be), and at the end of that period may be terminated by either side without notice. If, however, the employment continues beyond the original period, it can then only be terminated by such notice as, having regard to the position occupied by the employee, is reasonable or is required by the custom of the trade in which the employee is engaged.

Apart altogether from any question as to notice, a contract of service is terminated automatically by the death of either party or a dissolution of partnership if the employers are a firm. An Order of the Court for the winding-up of a Company also operates as a termination of the employment of its employees, although, curiously enough, the bankruptcy of a private employer does not have a similar effect. Some further notes on the circumstances which, in common law, justify the breaking of the contract and determine the conditions of service must be postponed to a later issue.

G. E. S.

WITH A PORTRAITIST IN THE STUDIO.

The reports of the P.P.A. Congress, Salon and R.P.S. Exhibitions having made large demands on our space during the past three weeks, the present series of chapters by Mr. J. Effel have unavoidably been interrupted. This week Mr. Effel resumes his place, and in the next paper of his will take accessories and backgrounds as his subject.

VIII.—THE PSYCHOLOGICAL ASPECT.

Psychology is a word very largely used nowadays, and invariably employed in a wrong sense. I mention this here because I wish to anticipate pedantic critics, who might fall foul of me for mis-use of the language. When I urge the importance of the psychological aspect, I mean that the student of portraiture should have a more than usual understanding of human nature, that he should know his own powers and his limitations, and should be quick to apprehend the likes and dislikes of the widely different individuals who patronise the portrait photographer. Briefly put, in this paper I use the word psychology to indicate the mental attitude of a photographer towards his clients, and of the clients towards the photographer, his methods and his work.

However we may argue the point, whether it pleases us or offends our vanity, we are to be classed with butchers, bakers, drapers, and other tradesmen in so far as we are all in business for profit, that we have goods to sell, that the better the quality of our goods and the more attractively they are displayed the greater will be our chances of success. Of course, no exact parallel can be drawn between photography and other sellers of commodities, for the photographer is in the unique position that he requires the active co-operation of his client in the production of his goods. One may not be in a good mood when the tailor is taking measurements, but that fact will not affect the ultimate fit of the garments, a hatter may be quite mad, yet make good hats; and who on earth would care a rap about the untidiness of the man who makes our boots? Attempt to classify the portrait photographer with other professions and businesses, and you will speedily find that all analogies break down. I know of no other calling, not even that of the portrait painter, where it is so essential that there should be something of psychological affinity between the two parties to ensure the happiest results. It is because the mood of the sitter counts for so much, and that mood is determined so largely by the moral effect produced by the artist, that I lay stress on the importance of the psychological consideration. We have heard a great deal about posing and lighting the body; I would talk to you now of posing and

lighting the mind. When you see more—in the psychical as well as the physical sense—you may actually photograph more.

Lest the impatient young photographer think I am going to counsel him to repeat words to the effect that every day his work gets better and better, I hasten to assure him that I am an essentially practical-minded person, and that the only "suggestion" I have faith in as a help to better business is that every day he should study his craft more and more.

A doctor does not rely upon his knowledge of the curative properties of drugs alone; the most successful lawyer is not necessarily the one with the most erudite knowledge of law; a knowledge of ailments, of their symptoms and proper treatment is, of course, taken for granted as being possessed by the general medical practitioner, the solicitor certainly knows the legal points which are obscure to the layman, yet I think I am well within the mark when I say that quite half of the

A Soulful Child.—This portrait is a capital illustration of numerous points touched on in this and previous articles. Everything is subordinate to the expression; it is a perfect example of a three-quarter view of the face. The direction of the eyes is dead right. Little light is used, and the small nose made to stand out. While there is hair in profusion, suggesting other treatment, the artist has purposely narrowed down the interest with the chiffon on the head. The student may see how stout or awkward figures could be so treated that the eye would be deceived about the outline. Note that the lighting is very simple, and that the fragile body is hidden with very full drapery.

work of the good doctor or lawyer is done by psychology, and the application of good common sense *minus* law or medicine.

Portrait photography from the show case to the reception room, to the dressing room and studio, from the advertising of goods, the selection and salesmanship, the manner and ability of the operator, is a calling where the psychological factor is of paramount importance. Meantime, I am only concerned with the studio part of the business. Let us consider what psychology has to do with producing better negatives.

When I say that the success of the studio worker is quite three parts brain work to one part technique, I mean a great deal. Mixing equal parts of sulphite and carbonate, boiling black prints in alum, hypo and dirt till they turn brown, leaving a hundred plates in a box containing standardised solution for twenty minutes, are not operations calling for much intellectual effort. In fact, nowadays, the production of negatives and prints of the "D. and P." order should merely be a case for the use of scales, thermometer, and a clock. Mark this point, that I am only writing for the assistant who is thoroughly conversant with judging exposures, and making negatives of good printing quality; with the scatter-brained photographer to whom every negative exposed sets him guessing, the man who sprinkles bromide (alleged 10 per cent. solution) lavishly, plays around with reducer and intensifier and "weighs" everything, from metol to hypo, in the same "chuck and chance it" way, I confess I can do nothing. Given the willing, able assistant (and I am convinced there are thousands capable of assimilating advanced tuition), the higher flights of portrait work will only be attained by working and thinking out things for himself. To make the photographer think, to make him realise that if he doesn't constantly mix brains with his formulæ he will get left in the struggle, are difficult enough tasks to set myself, but I not only hope to succeed, but to prove that the profession of portrait photographer is an intellectual one requiring at least as much mental effort as that of the writer or the actor.

I understand that it was the custom of a lady photographer who enjoyed a big vogue to ask her clients to visit her on a day previous to the appointment for the sitting. After a friendly chat over a cup of tea, the photographer reckoned that she had made progress with her client, and that the subsequent operations in the studio were greatly simplified by this preliminary interview. I do not doubt this contention for a moment, but those businesses must be very rare, nowadays, where the principal would have the leisure and the clients sufficient interest for this ritual. We live in an age where speed is a great consideration. I would be sadly lacking in psychology myself—to say nothing of humour—if I were to advise photographers generally to add hospitality and psychoanalysis to the other terrors popularly associated with a portrait studio.

But if a preliminary interview with a sitter is scarcely practical politics, the photographing successfully of a person one has never seen before is a task of extraordinary difficulty. I cannot think that Whistler would have given us a masterpiece of Carlyle had his medium been photography and the portrait taken in a few minutes on a busy Saturday afternoon. Yet that is how the majority of us have to work, and I submit very seriously that a man who "handles" thirty or forty clients daily, men, women, children, of all tempers and temperaments, and consistently produces work that pulls good orders with but a negligible number of resittings—I submit that he deserves to rank as a man of considerable professional skill. It rests with the individual photographer himself to maintain this dignity.

Charles Dickens, who was something of a psychologist, tells us somewhere that after knowing a man intimately for twenty years he was greatly surprised at an action of his which seemed quite foreign to his character. The great student of human nature was merely showing what a complex study the human mind is, yet photography is more exacting than novel-writing; mistakes are well-nigh irrevocable; there is more retouching and faking possible to the literary than to the photographic artist. What the trained observer failed to see in twenty years the portraitist is frequently asked to see in twenty seconds. Of course, it cannot be done. Surely, we have all had the disconcerting experience of taking negative after negative without quite satisfying ourselves, and then, when we had finished the sitting, of seeing the client posing and smiling delightfully? One cannot give a formula that will enable the earnest photographic worker to catch the self-conscious subject at what is literally the psychological moment. After all, one has to *see* a soul before one can photograph it; in what may be rightly called "portrait studies," qualities needed far more than art training and technical skill are insight, sympathy, and a profound knowledge of the joys and

sorrows of life. Look at that priceless gem, "Girl with a dead canary," by Greuze. Greater than the technique of the master is the heart of the artist. To the casual glance it may merely represent a child crying: in reality it is a study of a soul in pain. It is fortunate, maybe, that the photographing of souls has not yet become a craze. Why then waste time talking about it? For two sufficient reasons, the first being that I consider the rendering of "character" to be the highest achievement of the portraitist. But to the practical worker who has constantly to keep before him the question of profit, my second reason will have more weight. I merely urge that the portrait photographer should study psychology sufficiently to "sense" quickly what will appeal to his client. One may see a very vulgar soul, and yet not wish to photograph it, but certainly the vulgar one's clothes have to be taken to perfection. I said before that to *do* more the photographer must *see* more. I would now like to add that when he sees more he may want to *hide* more.

J. Effel.

(To be continued.)

SHORTENING THE ROUTE TO GOOD NEGATIVE MAKING.

[The Photographers' Association of America held their 40th annual Convention at Kansas City, Missouri, on May 1 to 6, 1922, under the presidency of Mr. G. L. Hostetler. The proceedings of this Convention are published in excellent style in book form running to 175 pages. Superbly printed, and with some excellent illustrations, the Association are to be congratulated on producing such a pleasing volume. Amongst many interesting lectures and demonstrations is one by Mr Harry Wills, of Rochester, New York, which, we think, will be of great use to our readers. The lecture, a somewhat abridged version of which appears below, consisted of practical hints on the various processes which enter into successful negative making. In particular, the dark-room practice suggested by Mr., Willa is a move in the right direction, for it is often in this branch of the work that improvement is most needed.]

Most of our troubles in making a negative begin in the studio, and I believe that many operators will agree with this statement. A great many photographers might insist that they do not sell the negative to their customer, but they sell the print. I insist that the negative is the foundation for the article which you are delivering to your customer, and if the foundation is weak, the structure cannot stand up. You may use all the schemes and all the business methods to get the people into your studio, but you must back up these methods with good photographs, otherwise your days of success in the photographic business are numbered. We are at a time to-day when we must make better photographs than we ever made before. You must begin with your negative, and for the most part that negative is made in your studio. If you are not getting negatives which yield satisfactory prints, you must analyse your working conditions as well as your ability to control your light, and find out the reason for your failures before you can hope to correct them. Three pieces of apparatus that I consider essential in any operating room for the convenience of putting any light under almost perfect

Fig. 1.

control, whether it be a skylight or an artificial light, are shown in fig. 1.

The little side screen is 36 inches wide and 7 feet high. There is an opaque shade on a spring roller, attached to the bottom of the frame, for raising and lowering at will. Attached at the top, over a small curtain rod, is a piece of black India linen, which slides backwards and forwards. There are times when one does not want to cut out all the sidelight, but simply soften or slightly diffuse it. By lowering the opaque shade, and drawing over the thin curtain from the top, you will be able to diffuse your light to almost any degree, or you can diffuse a small portion of the sidelight and allow the pure, unobstructed light to come in the other portion if required.

Fig. 2.

This little screen is very practical and inexpensive to manufacture yourself. After we have cut the side light down to where we want it, we have a head screen. It does not necessarily have to be this particular type of screen, but if the top light overbalances the side light, or is too broad on the forehead, you must have something to soften or point it up into balance with the side light, and it must be a screen of some kind—not too large—and easily adjusted. I

prefer the dark thin covering, as illustrated in the top of our side screen. The third piece of apparatus shown here for light-control is a reflector, which is very practical and easily manipulated. The dark side comes in very handy for cutting out the reflections from the floor which very frequently give trouble in eyeglasses. The top tilting effect on this reflector can be used to very good advantages for giving us a very slight illumination in our shadows, and yet turned at such an angle that it does not interfere with eyeglasses or reflect false lights into the eyes.

Fig. 2 represents two small black screens, which I consider, the handiest little screens in a studio, especially where spotlights and back-lights are being used. One screen is intended to be used in front or between the spotlight and the lens, so that the light cannot be seen in the lens. These screens are 24 inches wide, and 6½ feet. high, and are covered with black sateen. Sometimes two spotlights are used, and two screens are then essential. I have seen a great many fine negative possibilities spoiled by getting a flare of light into the lens. To arrive at the short cuts to good negative making we must simplify and make our working conditions in the studio easy and efficient. First, we must have a light of the right photographic quality and plenty of it. If we have too much light it is a very simple matter to cut down the volume. There is no excuse for not having plenty of the right kind of light at all times, for there are many artificial lighting devices at our command, which have proved to be very satisfactory.

Have the right kind of lenses to meet all your requirements, and do not try to photograph interiors, groups and large heads with the same lens. I want to dwell a moment on the importance of keeping lenses clean and ready for use at all times. It is very surprising to me to find throughout this country, so many dirty, neglected lenses in use every day. We cannot possibly expect to

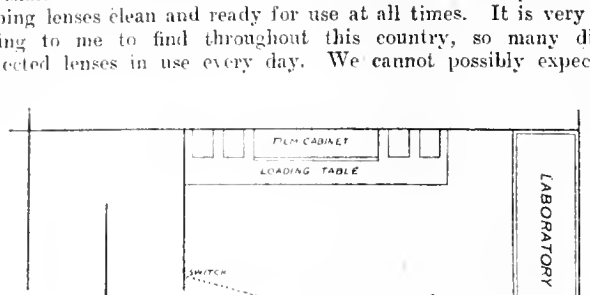


Fig. 3.

get clean, crisp, brilliant images with lenses that are covered with a scum. Our shutter and bulbs should be kept in working condition. If we have a shutter that does not work accurately and we cannot fix it, there is but one thing to do and that is to get a new one. It does not pay us to work with a shutter that does not open and close all the way every time.

A lens hood for the front of our lens is just as important as eye lashes are to protect our eyes from conflicting glaring rays of light. The lens is the eye which sees the picture, and if it does not see it clearly, we cannot expect to register it clearly on our film or plate. The camera and stand should be, at all times, in working condition and kept clean, inside as well as outside.

A presentable clean and practical working focussing cloth on the camera will add to the general appearance of your camera room, as well as backgrounds of different desirable tones, easy to manipulate, so that they do not require two people to handle. If chairs or other pieces of furniture are used, they should be of a practical type and kept in good condition and easy to handle. Your screens for light-control should be of a practical kind and should be kept in repair and be easy to manipulate. Convenience in the camera room: This reminds me of a demonstration I was called in to make a few weeks ago in a popular studio. Everything was working well except the camera stand, the cogs on the raising and lowering gear having been stripped. When we succeeded in getting the camera at the proper elevation, I was handed a large nail by the operator, who suggested that I slip it in between the cogs to hold the camera bed in position. It happened that I had been introduced as an expert operator to the lady who was posing for us, but before completing the work, I felt that I was anything but an expert operator, and that our lady subject thought we were a couple of cobblers. In other words, we had failed to make a favourable impression, because our apparatus was not working.

In regard to plate-holders, it is best to have enough filled to complete your sitting, without taking time to change, as much

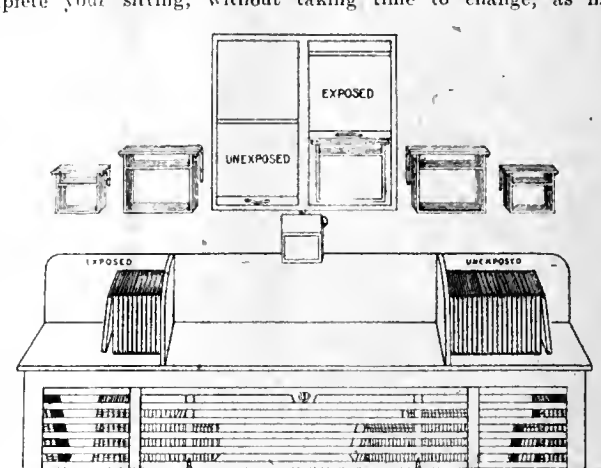


Fig. 4.

time is lost while the operator is in the dark-room changing his plates or films. It is also essential to have a rack on the side of your camera for keeping plate-holders within convenient reach. Another service which I consider very practical for taking care of the unexposed and exposed holders while working at the camera is a small table on rollers with compartments. This little table can be moved around with the camera within convenient reach of the operator, no matter which side of the camera he is working. In making the exposure, there is one rule nearly as old as photography itself, expose for the shadows and the high-lights will take care of themselves. Therefore, to be a successful operator you must learn to read the registering values of your shadows. The high-speed plate or film does not contain the same line of gradation as that of the medium speed product. Therefore, the high-speed plate should be developed to a greater density than those of lesser speed, otherwise you will be inclined to get flat, thin negatives.

We will now take the dark-room work as briefly as possible and endeavour to show by proper equipment and conveniences that we can also make short-cuts and sure-cuts in the developing of the negative. Fig. 3 shows a suggested floor plan of a practical dark-room, containing chemical cabinet, developing bench and sink, loading table, and drying cabinet. A dark-room should be a pleasant and convenient room to work in, and there should be plenty of ventilation in this room. It is just as essential to have good ventilation for the good of the sensitive gelatine products, as it is for your good health. The walls of this dark-room do not have to be black or dark. They can be white if no white light enters

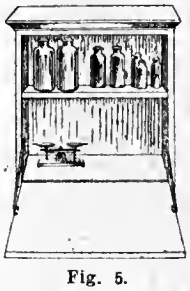


Fig. 5.

the room. Fig. 4 shows the loading table, which, I think, is very practical. It has a place for exposed and unexposed plate-holders, and has two cabinets immediately above the centre of the table for exposed and unexposed plates. In the centre is a small safe-light to assist in loading the plates or film. On either side of the centre cabinet are racks for plate or film developing hangers to keep them off the table and off the floor. Underneath is a little

lattice door to enable you to see the condition of your plate or film stock, and a shelf for keeping surplus holders.

Fig. 5 represents the chemical cabinet which is very convenient to have in a dark-room. The door opens down from the top, and when opened forms a shelf on which to weigh out your chemicals. When finished push everything back and close the door. This eliminates all possibility of chemical dust in the room, and in many cases saves a multitude of troubles. A developing bench and sink is illustrated in fig. 6. On the left-hand side we have a developing

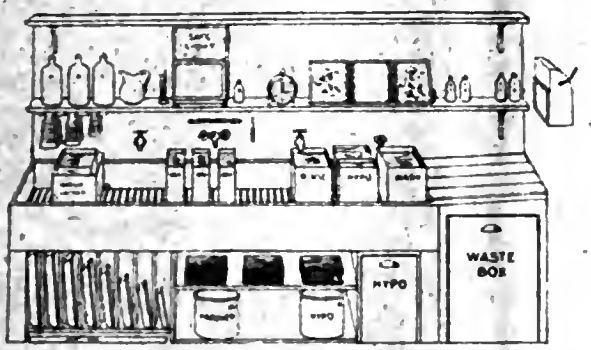


Fig. 6.

tank in a water jacket made of galvanised iron. There should be a two-inch space all round the developing tank. In cold weather this can be filled with warm water to raise the temperature, and in hot weather with ice or cold water to reduce the temperature. In the centre are three developing tanks, which contain solutions of varying strengths. To the right is a rinsing tank with water running into it. Next we have two hypo-baths. When the negative comes out of the rinsing tank, it should go into the first hypo bath. When that bath is full it should by all means be taken over to No. 2, and then from there it should be removed to the washing-box. The importance of two hypo baths is that No. 1 bath receives all the water and alkali that remains in your negative and will very shortly weaken the No. 1 bath. For that reason, after a negative goes through No. 1 it should always be taken into No. 2 and left there for a sufficient length of time until it is thoroughly fixed. No. 2 bath is always a comparatively fresh bath, and the method for keeping it fresh is this: When No. 1 bath does not clear a negative in ten minutes throw it away, and put No. 2 bath in the position of No. 1. Then put a new bath in the position of No. 2. For the convenience of making this bath up quickly and keeping it up to standard, we have underneath the sink two jars; one of hardener made up according to formula and one of hypo also according to formula. Take the given amount of hypo and the given amount of hardener and we have a new bath in very short time. The principal importance of two fixing baths is the freedom from stain. A negative fixed in an over-worked bath, while it may appear clear, contains an invisible substance which soon becomes discoloured, sometimes unfortunately all over the negative and other times only in spots. One cannot put too much stress on the importance of properly fixing the negatives. If a negative is properly fixed it can be washed in circulating water for 15 minutes. Directly over the washing and fixing boxes is a negative comparator. This is very important to standardise the density of negatives. Sometimes the density varies to a very great degree, and, at the same time, the worker is confident that all are just the same density. In this comparator are put one negative of a dark ground and one of a light ground of the average density required to make the kind of prints you are accustomed to making. You can always tell when looking through the washed negatives, before hanging them up, just how far off is the density, or if in doubt, stop during development, fix out a negative and compare it. The centre compartment of this comparator is ground glass with light behind. When developing the average portrait plate or film, Wratten Safelight, Series 2, is quite practical for the very highest speed product, but if you are using panchromatic plates it is necessary to replace it with the Series 3, which is a green light. Panchromatic negatives should be developed by the time and temperature method, as it is very difficult even with a green light to judge the developing density. The green light is a convenience for handling the plates only. If the proper kind of lights are used, a dark-room should always be light enough to see all around it. Under the drain board we have a waste box for all waste papers, film and plate containers, also a hypo bin. At the extreme left we have racks for such trays that might be used for intensifying, reducing, etc.

Fig. 7 illustrates a drying box either for plates or for films. This box can be installed in the dark-room or in some other room convenient. It is 28 inches high, has a shelf in the centre, and is deep enough to take the drying racks. Sliding doors are practical for the reason that they can be opened at any section and negative racks put inside. The entire box can be covered with cheese cloth, or it can be made of compo board. If there is not too much dust flying around, I would prefer the cheese-cloth. There is an opening at one end for a fan which gives air circulation through the negatives, causing them to dry quickly, and free from grit or dirt. Sometimes it may be convenient to put the fan on the outside of the dark-room wall and bring the air from another room.

We now come to the different kinds of developer used for the making of the negative. We have pyro, the old stand-by, Elon and hydroquinone, and a number of others. Pyro, together with Elon, makes a very desirable developer. Elon has the action of a very soft developer, and, properly balanced with either pyro or hydroquinone, gives very pleasing effects, but remember that pyro and hydroquinone are the two contrast agents, and those agents, properly proportioned, with carbonate and sulphite, will give you a satisfactory reduction of the silver image, when used at the proper temperature. Pyro, Elon, or hydroquinone should be used at 65 degrees Fahr. If a developer containing hydroquinone and Elon is used at a temperature lower than 65 degrees, the action of the hydroquinone will be greatly reduced. The Elon, doing practically all the work, will give you a soft, weak negative. In using pyro-soda two images are made. One, known as the stain or pyro image, and the other the silver image. Therefore, in pyro developer it is essential that allowance is made for this stain in judging density. A negative that does not have this stain, such as an Elon-hydroquinone developed negative, must be carried further so that the high-lights do not grey over in the print. Sulphite of soda is included in this developer as a preservative and preventive of staining. It has the greatest affinity for oxygen of any of the chemicals that we are using. Therefore, it keeps the oxygen away from the pyro until the sulphite has been exhausted by the oxygen, and then the pyro will commence to discolour. Sulphite is your colour control. soda carbonate gives the detail and pyro the contrast. These three chemicals can be balanced to produce any desired type of negative. I have found that many localities require different balance of the chemicals used in developer. For instance, if alkali is found in the water it will be necessary to decrease the amount of carbonate used. If hard-water is the local condition, it is necessary to increase the amount of carbonate, but remember that when you increase the amount of carbonate it is also necessary to increase the amount of sulphite, I have also found water conditions that required more pyro. Sometimes, in addition, it was advisable to use a small quantity of Elon and hydroquinone in order to get the action required. In some places iron is very prevalent in the water, and it is then necessary to use more sulphite in order to keep down the stain. There is absolutely no excuse for getting a stained negative, or a negative of an undesirable colour, if you understand your local water conditions and the chemicals you are using. That, together with the proper hypo bath and sufficient

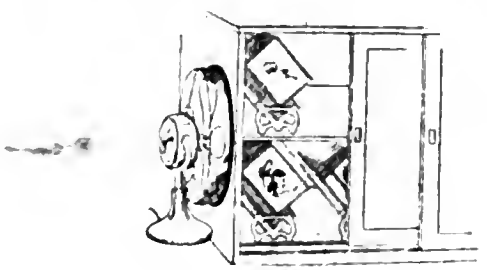


Fig. 7.

time for fixing, will prevent stains either with films or plates. There is positively no reason why films should stain any more readily than plates if the developers are balanced and the hypo baths are in good working condition.

At this point I want to mention the importance of pure chemicals. There is a vast difference between both the carbonate and sulphite of soda that is on the market to-day. The best of them are comparatively cheap, and it will pay you to buy such chemicals that carry a guarantee; chemicals that are tested and known to be pure,

are the cheapest investment you can possibly make. Tank development is the one step of progress that we have made, and I for one, would never go back to dish development if for nothing else than for the reason that it keeps the stains from my fingers. Tank development is more practical for the reason that the chemicals remain in better balance throughout the development of the negatives on account of not being subjected to so much oxygen from the air as is the case in dish developing. Let me impress upon you the importance of not over-using your tank developer. Several formulæ are given for their keeping quality, and it is generally recommended that a tank of developer can be used from day to day with equally good results This is true in a measure only, and quite a number of negatives can be developed in the same tank of developer. If it is strengthened and kept up to standard, it can be used the second, third, and possibly the fourth day with fairly good results, but every time you develop a negative you leave just so much bromide in the developer, and this bromide will eventually retard the developing action, and your negatives will look weak and under-exposed. On the other hand a tank of developer may be kept for possibly two weeks if it is covered with a floating lid to exclude the air, and is of normal temperature, provided you have not developed a great number of negatives in the same developer. Therefore, the life of a developer should be estimated by both quantity of negatives developed, and the number of days it has been standing as well as the temperature of solution. Renew your tank developer frequently, and whenever you find that you are not getting results, that are up to your standard, make up a new developer.

Many people have, to their disappointment, taken out of the washing-box negatives showing reticulation throughout the image and background, caused by softening of the gelatine in hot weather. This can be prevented by using a chrome alum solution, 6 ozs. to 1 gallon water. After developing rinse your negative quickly and put it into this solution, leaving it there for from 30 seconds to 1½ minutes, then without washing put it into the fixing bath, thoroughly fix and then wash, and you will have no trouble in hot weather. It is important that you keep this chrome alum bath at a temperature not higher than 70 degrees, and your hypo practically the same. If this bath is used the second day, I would suggest putting in a few drops of sulphuric acid, being careful that the bath is not used after it becomes alkaline. When the bath is fresh be careful that your negatives do not remain in too long, as, if so, it will be almost impossible to fix them This chrome alum intermediate bath is important for summer use, not only to keep the gelatine from frilling, but to keep your negatives from drying too dense, which is the natural result from the swelling of the gelatine in hot weather. Developing, fixing, and washing have now been considered, and the negatives should now be dried in a room with good air circulation, and free from dust, or in a drying box, as illustrated in fig. 7. After the negatives are dried they are ready for proof retouching.

HARRY WILLS.

WHITE BACKGROUNDS AND SHADOW PROFILES.

QUITE the best portrait of the professional type in the 1922 London Salon of Photography was a portrait of a lady, her shadowy profile full of exquisite detail being shown against a nearly white background. Whiter backgrounds than that shown in the Salon specimen are common in professional studio portraiture, and some time ago a London lady professional worker made a specialty of heads—full, three-quarter, and side-face—against what appeared to be, and, no doubt, was, a perfectly white background. So white was the background in some of these famous and much-admired examples that blocking-out was suspected by the uninitiated, but a close examination of the outline of the hair was enough to rule out the use of an opaque medium, blocking-out being out of the question.

White backgrounds are usually very disappointing to those who use them for the first time, or who fail to get acquainted with them after constant use. To the photographic plate white material is really white only when it is effectively illuminated, and white may very easily become a grey, a fact one is made well acquainted with when using a sheet of white cardboard as a background for flowers and still-life subjects. A white background is affected by shadow and poorness of direct light more than a ground of any other shade, and even its distance from sitter and camera will alter the actinic power of its whiteness. Even a cloud passing over the sun will grey the whiteness of a background, though the eye may not notic it. The eye knows the ground to be white both in sunshine an shadow, but the sensitive plate is inanimate with no reasonin powers, and it pictures only that which it sees, which, in the cas of a "dulled" white background, is a greyed whiteness, such a one gets when copying a black and white line subject on a proces plate on a dull day.

The inexperienced worker might suppose that "whiteness" (density in negative) could be increased by slight under-exposur with strong development, but this is not easy of accomplishment and any attempt to increase density will result in the upsetting o any delicate fones seen in the image of the figure posed before th white ground. Shadow profiles are not easy things to "light" effectively, and it is of little use to spend a lot of time arrangin a shadow portrait if the effect is to be lost in the process o developing.

It is possible to get many effective shades of whiteness and grey ness with a properly-made white background by altering the angl of it, its distance from the camera and sitter, and the blinds abou it, but to picture it at its whitest, the ground must be in a posi tion to catch the whitest of light, and, what is more important hold it, as a properly-made lantern screen will hold it, a light absorbing material being fatal to good results.

Shadow profiles (I do not mean silhouettes) are difficult enough t light effectively, and more difficult to render in such a way tha all details may be seen in the print, and in the making of such pictures one is up against a double proposition, the correct balancing of one (the shadow portrait) against the other (the white background) calling for some experience and skill.

The value of a tone or shade is estimated by its worth or im portance as related to other tones or shades, either low or high, weak or strong. When tones and shades are placed in a portrait precisely as they appear in nature the picture is technically spoken of as "good," or "true" in values; when an artist fails to pro duce them as they naturally appear—fails to produce just relation ships—his result is called "weak" in values, and when he elects to exaggerate them for purposes of artistic effect they are some times spoken of as "strong" in values. The effective rendering of the lower shades in portraiture is as important as the picturing of the higher lights, and one is made to realise this fact when taking shadow portraits.

"Autant d'hommes, autant d'avis," as my chief used to remark when I, as an assistant in a Paris studio, tried my own methods of lighting. There are, no doubt, many opinions as to the most effective method of posing and "lighting" a shadow profile against a white background. I am now—but have not always been—in favour of posing the sitter back towards a soft and much diffused light, and placing a black background or cloth as near to the "profiled nose" of the sitter as it is possible to place it without its being included in the field of view. Then by cutting down the light very judiciously between sitter and lens, strengthening it upon the background, and so balancing the whole, one may, with modern anastigmats of a large aperture and well-backed or matt-surfaced rapid plates, secure good results with a minimum of exposure. Exposures, however, must be so arranged as to secure proper shadow detail and proper density by direct development—preferably tank—because of the danger of trying to alter the usual and easy run of things by tinkering with the developer.

PRACTITIONER.

THE CLUB PHOTOGRAPHER STANDARD FOR MOUNTS.—The diversity in mount sizes, especially in exhibition prints, is a point which is continually worrying club secretaries and hanging committees. If a series of standard sizes were adhered to, much less trouble would be given and a more regular arrangement of the exhibited pictures would be possible. The "Club Photographer" has made arrangements with Messrs. W. Butcher and Sons, Ltd., to cut and market duplex mounts on card of the following sizes and prices:—

12 x 10	Packet of 12	2s. 0d.
15 x 12	Packet of 12	3s. 0d.
20 x 15½	Packet of 12	5s. 6d.
24 x 19	Packet of 12	10s. 0d.

The mounts are double-sided, combining white and light grey in one series, and cream and fawn in another. A ballot has been taken of the various societies as to the advisability of the last two sizes being adopted as the standard, and it is proposed to recommend these sizes to all exhibiting members of the various clubs.

Assistants' Notes.

Notes by and for assistants will be considered for this column. Payment for accepted contributions is made on the first of the month following publication.

Modest and Correct Demeanour.

Applicants for situations are prone to pay too little attention to demeanour at interviews, a fact many proprietors of photographic establishments are well aware of. Manners count to-day nearly if not quite, as much as qualifications, although the fact is not often stated publicly. A member of the Cambridgeshire Education Committee a few days ago, however, went out of his way to speak of the demeanour of a candidate for a post, and seekers after photographic appointments would do well to make a note of its importance. There were eighty applicants for the post, seven of whom were interviewed by a committee. One was chosen, and, in giving a report of the committee's work of selecting and appointing the man, a committeeman said, "Mr. ——— was the most distinguished of the applicants, but I do not think that was the reason why he was recommended, as much for his testimonials and demeanour at the interview." A situation-seeker's interview with a sole proprietor may be trying enough for one's nerves, but an interview with a board or committee is worse, because of the many pairs of eyes at work. The interview may, moreover, prove to be the turning-point of one's career, and it behoves the "victim" to have his wits about him, not to profess too much, and to remember that modest and correct demeanour meets with its reward.—L. T. W.

Manipulating Studio Blinds.

A generation ago a considerable amount of attention was paid to the art of studio-blind manipulation by the majority of professional photographers, but to-day it is only the third-rate worker who makes an elaborate business of it before the eyes of the sitter. Apprentices and assistants in my early days were enjoined by principals to make a good show of their task of blind-pushing by means of a pole, on the supposition that the more they manipulated the blinds the more was the sitter impressed, the latter going away with the idea that the operator took an unusual amount of trouble to get a satisfactory result.

It was then the custom—and is still the custom in old-fashioned studios—to keep the "glass-house" well lighted, to have most of the blinds out of use, and to start with as much light upon the sitter as possible. The sitter posed, blinds were then pushed or drawn until a satisfactory lighting was obtained, and I have known very quick operators (who have secured a proper lighting in a very few minutes) to fix upon a lighting, to "undo" it and to do the work all over again, lest the sitter should think that not sufficient pains were taken to secure an effective lighting. Many customers may like a lot of fuss, and applaud a performance with a bamboo stick or pole, but there are some whom it would unsettle and annoy, and in studios of the better-class photographers blind-manipulation is modified or done so unobtrusively as not to offend.

In many of the very best studios to-day operators work in the reverse way to the plan adopted by our fathers, and the system has much to recommend it. The present-day man who wishes for—and secures—the best results is he who commences with a darkened studio—every blind drawn—admitting light rather than eliminating it after the sitter has been roughly posed, and I advise all operators to make trial of the two systems.

It will be found that the play of light upon the features, its power of modelling, and the making of light and shade are better and more quickly appreciated and understood when one starts with darkness and admits light, rather than when the sitter is posed in a blaze of light which is afterwards toned down. Superfluous light dazzles the operator, and he fails to see—for a time, at any rate—the most delicate shades, whereas by starting in darkness all delicacies of tone and modelling are more clearly and quickly seen.—L. T. W.

Copying Line Drawings.

The reproduction of line subjects on slow process plates seems at first sight to be about as easy a photographic process as could be imagined. Unless conditions are favourable and exposures be kept within very narrow limits of variation from the "correct," an exact rendering of the original cannot be expected. The reason for this is that in over-exposure the light irradiates over the edges of the lines and so narrows them. The finer work thus tends to become thinner still, often to unprintable density, especially when, as far too often happens, the artist has assisted in giving the effect of delicacy to such touches as much by thinning his ink as by reducing the actual width of his line.

When attempts are made to improve matters by cutting and by subsequent intensification the fatter lines are usually widened because the reducer inside the lines has no work to do and reinforces that which is attacking the edges while on the finer parts it has veil to remove. When matters are still further complicated by uneven lighting (which means variation of exposure locally), or by faulty arrangement of lamps causing light to catch the shiny surface of modern drawing inks, the final result can easily become a mere caricature of the original.—D. C.

Exhibitions.

GLASGOW AND WEST OF SCOTLAND SOCIETY OF PROFESSIONAL PHOTOGRAPHERS.

Under the auspices of this Society there was held last week in the McLellan Galleries, Glasgow, an exhibition of photographic art. The Society's efforts met with gratifying success, and it is hoped that it will do much to stimulate photographic business in Glasgow and the surrounding district. The exhibition is the first professional photographers' exhibition organised in Scotland. Although the Society was only formed two years ago it has already accomplished much useful work, and is now fully representative of professional photographers in the West of Scotland. The success of last week's exhibition is such as amply to justify the Society in making the event an annual one.

There were in all some 300 exhibits, the show being exceptionally strong in portraiture, but there were included many excellent specimens of commercial photographs and also a number of views of architectural and other subjects. R. Brinkley and Son had an attractive group of portraits. S. Langfier had on view some striking portrait studies delicately finished in water colour. Mr. Bairnher contributed a group of subjects, some of which were in water colour and others in sepia-toned bromide. John Doig exhibited portraiture and commercial photography, while Whyte and Sons showed a group of portraits and commercial subjects of great merit. Coloured portraits formed a prominent feature of the exhibits by the Elite Photo Company. W. Nicol Smith provided a most effective display consisting entirely of portraiture in soft tones. Among the studies shown by Messrs. Lafayette was a striking portrait of Sir Alfred Yarrow, Bart., while Messrs Turnbull and Maunds displayed among other excellent pictures a portrait of Mr. Allan Maunds, of the Glasgow School of Art. The group of subjects shown by W. Ralston were notable for their lighting effects and attracted considerable attention. Messrs. Buchanan and Armour exhibited an attractive mountain scene and also works in portraiture, while child studies in colour formed a feature of the exhibits of Wm. Elsmore. Messrs. Weir Bros. had on view a number of attractive photographs of children, and among the group exhibited by Archibald Fairbairn, an enlarged photograph of a young officer was outstanding. R. Shankland displayed a number of excellent photographs of commercial subjects.

During the whole week the exhibition was well patronised. On entering the hall each visitor was supplied by the commissionnaire at the door with a leaflet giving a few reasons in concise form why photographs should be secured.

FORTHCOMING EXHIBITIONS.

October 18 to 21. Rotherham Photographic Society. Hon. Secretary, S. G. Laversidge, Orissa, Gerard Road, Rotherham.

October 18 to 28. Portsmouth Camera Club. Particulars from the Hon. Secretary, C. C. Davies, 25, Stubbington Avenue, North End, Portsmouth.

November 4 to 11. Bournemouth Camera Club. Latest dates, entry forms, October 20; exhibits, October 31. Particulars from the Hon. Secretary, 88, Old Christchurch Road, Bournemouth.

New Books.

Patents for Inventions. By J. Ewart Walker, B.A., and R. Bruce Foster, B.Sc. London: Sir Isaac Pitman, 21s. net.

A BOOK which gives comprehensive guidance in the procedure of taking out a patent, and, so far as can be done, in patent law, is certainly one which is much to be desired. The authors may, therefore, be congratulated on having taken up this task, which is none of the easiest if the book is to be of service to people who are not lawyers. It can certainly be said that although both of the authors are barristers-at-law, they have not unduly inflicted legal language upon the reader. While their text is rather dreary reading, it is at any rate explicit and largely free from the technical expressions which occur in such abundance in the well-known text books on patent law. Probably the authors are fully conscious of the pains they have taken to set forth the legal technicalities of a patentee's rights and liabilities in a way which the layman can readily understand.

Properly speaking, the book divides itself into two parts, the first being the procedure which is followed in the course of the passage of a patent application through the Patent Office and in the opposition to a patent. One of the authors is known to us as an examiner in the Patent Office, and therefore this part of the text may be taken as embodying the official mind of the Patent Office in respect to the course which an inventor or his agent should follow. The second and larger part of the book concerns the status of the patentee after his patent has been granted and sealed by the Patent Office. Perhaps sufficient emphasis is not laid by the authors upon the fact that the granting of a patent in the ordinary course confers a kind of protection which is far less substantial than probably many inventors suppose. The Patent Office follows the routine according to the comparatively limited powers which are given it. When an inventor has got his patent, it still remains to be decided whether it is worth anything. That is left to the expensive machinery of the Law Courts, where the whole claims of a patentee may be argued afresh from the very start and evidence produced in support of or opposition to them. The optimistic inventor may be recommended to study the pages of the present work, in which are described the numerous grounds upon which a patent may be declared invalid, e.g., want of novelty, want of inventive ingenuity, insufficient description, in addition to such errors of drafting as disconformity between the provisional and complete specification. The authors support their general discussion of these important matters by references to cases which have been heard in the Courts, but they do not give any details of these proceedings—they could hardly do so, except in a very much larger treatise—so that a reader must be on the alert to recognise that his own particular case corresponds with one or other of the general defects. Other chapters deal with the rights of a patentee regarding infringement of his monopoly, the granting of licences and transfer of patents, and the text is brought fully up to date by inclusion of sections dealing with the effect of war measures upon patent rights. The book includes also the texts of the Patents and Designs Acts of 1907, 1914, and 1919, statutory rules and orders, a set of the official patents' forms, and a list of 510 cases heard in the Courts to which reference is made in the text.

PHOTOGRAPHING THE SAHARA.—According to the daily papers a fourth attempt to complete a photographic survey of the Sahara desert is to be made by a Mr. N. A. Greville and a brother. The task, it appears, was commenced nearly three years ago, and nine white men have lost their lives in the previous attempts to reach Lagos, British West Africa, from Algiers. About £15,000 has been spent up to the present, and another £10,000 will be required, there being still 400 miles of the journey to picture,

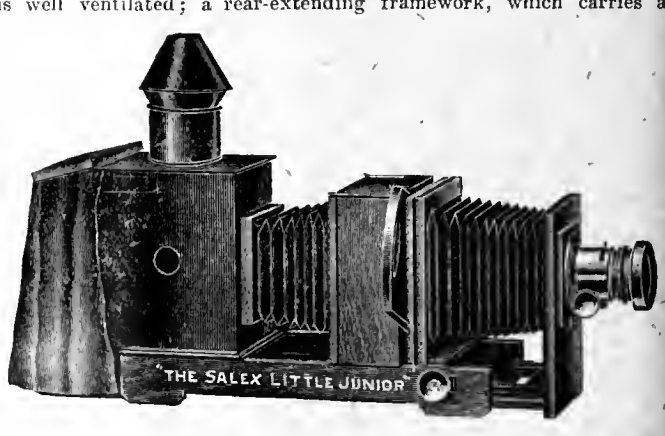
"This time," says Mr. Greville, "I propose to start from Lagos and make for Zinder, about 600 miles away. After we leave Zinder we shall be completely cut off from the outside world. We are choosing the most favourable weather, and if we are lucky shall complete the job in about six months. The difficulties are formidable. Anyone who has not experienced Sahara sandstorms cannot realise the terror of them. The sand beats down with the force of pebbles. A plain may be turned into hilly country in a night by one of these storms. On one occasion we found that the surface of the country had risen 250 ft. in places in one night.

New Apparatus.

SPECIALIST SECONDS METER.—Messrs. E. B. Fry, Ltd., 110, Pratt Street, London, N.W.1, send us this ingenious and handy appliance for timing exposures, etc., in the dark room. It consists of a bell mounted upon a wooden block. The mechanism for ringing the bell is very simple, and contains no clockwork or intricate device which could possibly get out of order. A metal tube is attached to a rocking lever mounted inside the bell, and a small steel ball runs up and down the tube. The pendulum, which is attached loosely to a hook on the lever, provides sufficient momentum to keep the apparatus working for seven or eight minutes. At one end of the stroke the steel ball runs up the tube, and at the other end it is allowed to fall upon the inner surface of the bell, making a faint but perfectly audible ring. The wooden block is attached firmly with the screws supplied in any vertical position, and the two parts of the pendulum are then screwed together so that the hook and the weight are in line with each other. The pendulum is then attached to the flat hook under the bell and set in motion. Accurate timing of seconds may be adjusted by the joint and long screw provided on the pendulum rods, but usually very little alteration is necessary. The swing of the pendulum is constant, and, whether it is long or short, the timing of the ring of the bell is always the same. The angle of swing, however, should not exceed 60 deg. if the greatest accuracy is desired.

In counting seconds by this meter, one commences exposing or timing upon the first ring. The next ring will then be one second; the next ring two seconds, and so on. We have tested the meter in the dark-room, and find it remarkably accurate. The pendulum and bell are plated and highly polished, and the meter is finished in excellent style. The price complete, ready for fixing, is 7s. 6d.

THE SALEX LITTLE JUNIOR ENLARGER.—The City Sale and Exchange, 54, Lime Street, London, E.C.3, have just introduced this compact and well-made enlarger. Strongly constructed of oak and of excellent workmanship, it is a handsome piece of apparatus, capable of good work. The light-chamber is of ample size and is well ventilated; a rear-extending framework, which carries a



curtain, is provided. The condenser is contained in a box of novel design, allowing a current of air to circulate between the lenses. The cells are not screwed into a tube, but are held by clips in the wooden frame. Thus they can be easily removed for cleaning. The negative carrier is simple yet efficient. Being quite a free member, it can be moved into any position, and is firmly held by spring clips. Focussing is by an improved

rack and pinion: the teeth of both racks and pinions are cut deeper than usual, thus ensuring smooth movement without sag or back-lash. No lens is supplied, but a specially large lens panel is fitted, allowing lenses of the Petzval type being used. The Salex Little Junior Enlarger is made in two sizes—viz., for 3½ in. × 2½ in. and ¼-plate negatives, the prices of which are £4 4s and £5 3s. respectively. Lenses may be supplied suitable for these enlargers from 12s. 6d. upwards.

THE TELEROS LENS.—Messrs. Ross, Ltd., of Clapham Common, London, S.W.4, have introduced a new type of single focus telephoto lens, which combines lightness of weight, with high efficiency and speed. The new lens differs from the "Teleentric" in that its front component is a doublet and back component a triplet. In the "Telecentric" this was reversed, the front being a triplet and the back a doublet. This alteration of the components allows the lens to be made generally smaller, and the "Teleros" is only half the weight of a corresponding lens of the older type. The "Teleros" lens, which Messrs. Ross have sent us for trial, is of 11 ins. equivalent focus, and covers a 4¼ by 3¼ plate. Its aperture is f/5 5, which allows of very rapid focal-plane exposures being made, and generally the lens is a great advance upon the older model. The enlarged image given by the "Teleros" is of great use when photographing press, sporting, and natural history subjects, while it is also of considerable value for portraiture, child studies, and pictorial landscapes. We find upon actual test of this lens that the definition at full aperture, is quite equal to that obtained by the highest class anastigmat, while for speed, and quality of the image, it is all that the makers claim for it. The lens of 11 ins. equivalent focus has a total length overall of 3⅞ ins. and requires a camera extension of 6¼ ins from flange to screen. The Teleros lens is made in five sizes, the aperture in each case being f/5.5. The equivalent focus and price of each size are as follows:—9 in. £11 10s.; 11-in., £14; 12-in., £15 5s.; 13 in., £16 15s.; and 17-in., £27 10s. An interesting booklet, with particulars of this lens, may be obtained upon application from Messrs Ross, Ltd., Clapham Common, London, S.W.4.

QUICK LEVEL TOP.—A handy little fitting for the camera tripod has just reached us from Andrew H. Baird, of 33/39, Lothian Street, Edinburgh. It is called the "Lothian" quick level top, and is intended for use as a tilting device for a camera of moderate size. It consists of two small discs with flat surfaces, one of which may be attached to the camera stand by means of the ordinary screw, while the other which contains a screw is intended to take the camera. These two discs are attached by means of small rods to a universal clamping device, which is operated by a screw and wing nut. The fitting allows the camera to be firmly held in any position, while it also acts as a turntable. The usefulness of such a fitting will be particularly realised in dealing with such subjects as flowers, carvings, museum specimens, when various positions of the camera are necessary. The stand may be firmly fixed in a level position, and the camera may then be adjusted to requirements. Thus by simply loosening the wing nut, the camera may be pointed up or down over a very wide range, or turned in any direction. The "Lothian" quick level top is small in size, and will occupy very little space in the camera bag, but being made of gun-metal it is extremely strong. The price of this handy little device is 7s 10d. post free.

New Materials.

Gevaert Lantero Plates. Made by Gevaert, Ltd., 115, Walmer Rd., London, W.10.

LANTERN SLIDE makers will thank us for drawing their attention to these plates, issued in two varieties, viz., black-tone and warm-tone. The latter are about 1-30th the speed of the former, and require an exposure of about 5 secs. at 4 in. from a 16-c.p. bulb. These plates in parti ular are a valuable power in the hands of the slide maker on account of the fine range of warm tones which they readily yield with the developer recommended by the makers for both grades, viz.:—

Metol	25 grs.
Hydroquinone	9 grs.
Soda sulphite (cryst.)	350 grs.
Soda carbonate (cryst.)	1 oz.
Potass bromide	9 grs.
Water, distilled	20 ozs.

We have also used the metol hydroquinone-thiocarbamide developer recently recommended by Mr. J. Dudley Johnston for these plates, and have obtained some especially pleasing tones, ranging from blue to dark chocolate brown. Four solutions are required, each of which will keep indefinitely under the usual conditions:—

Solution A:

Metol	44 grs.
Hydroquinone	30 grs.
Sodium sulphite (cryst.)	1 oz.
Sodium carbonate (cryst.)	1½ ozs.
Water	20 ozs

Solution B:
Ammonium carbonate ... 10 per cent. solution.

Solution C:
Ammonium bromide ... 10 per cent. solution.

Solution D:

Thiocarbamide	33 grs.
Ammonium bromide	11 grs.
Water	10 ozs.

Printing by contact and using an Edison Fullolite 60-watt lamp, 5 secs. at 2 ft., was found to be the unit of exposure with negatives of average density. For bluish tones the factor is 6, making the exposure 30 secs. The developer is compounded as follows:—

Solution A
Metol hydroquinone developer ... ... 6 drams.

Solution B:
10 per cent. ammonium carbonate 1 dram.

Solution C
10 per cent. ammonium bromide ... 1 dram

Solution D
Thiocarbamide solution ... ... 30 mins.

By varying the exposure and temperature of the developing solution many fine tones ranging from blue-black to purple may be obtained. For chocolate and brown tones a slight alteration of the developer is found advisable. The exposure factor for sepia tones is 5, thus the exposure under the conditions of lighting mentioned above was 25 secs. The developer is as follows:—A, 6 drs; B, ½ dr.; C, 1½ drs.: 10 per cent. hypo, 20 minims.

For the black tone plates, the metol-hydroquinone developer, solution A may be used alone. The plates give good dense blacks free from "greenishness," and have particularly transparent high lights. There is one point we noticed when using the Gevaert lantern plates, namely, that fixing takes place very quickly in the ordinary 20 per cent. hypo solution. This is a great advantage, but it should not lead the worker to curtail the time of fixing unduly. Ten minutes should be allowed to ensure complete fixation, and the plate should be moved about in the solution for the first thirty seconds. While clearing with Farmer's reducer is a great advantage in lantern slide making, the Gevaert plate requires very little clearing, since the shadows veil scarcely at all. From a thorough test of both the black and warm tone Gevaert lantern plates we have every confidence in naming them as materials of pre-eminent quality for the slide maker.

PORTRAITS OF H.R.H. THE PRINCE OF WALES.—Some excellent portraits of H.R.H. the Prince of Wales, in scout uniform, were taken at York House on Saturday, October 7, prior to his departure for the great scout rally at Alexandra Park. The portraits were taken by Mr. Cyril D. Venning, of Messrs. Val L'Estrange (1916), Ltd., of Knightsbridge.

Meetings of Societies.

MEETINGS OF SOCIETIES NEXT WEEK.

MONDAY, OCTOBER 16.

Birmingham Phot. Art Club. Annual General Meeting.
Bradford Phot. Soc.—"What the Society's Enlarger Can Do." Bernal Riley.
Dewsbury Phot. Soc.—"Transferotype." W. H. Hammond.
Kidderminster and District P.S.—"Norway—A Peep at its Folk and Fjords." F. W. Pilditch.
Southampton C.C.—"Across Africa in War-time." J. B. Simester.
Wallasey Amateur P.S.—"Killarney." J. Mansell.

TUESDAY, OCTOBER 17.

Birmingham P.S.—"Belgium before the War." W. J. Ballard.
Bournemouth C.C.—"Enlarging." J. Thomas.
Cambridge P.S.—"Apparatus and How to Use it." The Secretary.
Exeter C.C.—"Prehistoric Man." W. S. Lewis.
Hackney P.S.—Outing to Winchelsea and Rye.
Halifax Scientific Soc.—Social Evening.
Leeds P.S.—"The Great School of Portraiture in England." H. Thompson.
Manchester Amateur P.S.—Beginners' Print Competition.
Morley Amateur P.S.—"Round About Some Yorkshire Villages." W. E. Cundill.
Slough and District Y.M.C.A. Phot. Club.—"Amateur Photographer" and "Photography," 1921, Prize Slides.
South Glasgow C.C.—Lantern Slide Monthly Competition and Criticism of Slides.

WEDNESDAY, OCTOBER 18.

Borough Polytechnic P.S.—Third Print Competition.
Croydon C.C.—"A Dark-room under the Tiles." J. C. Coffin.
Edinburgh P.S.—"Bromide Enlarging." A. H. MacLucas.
Edinburgh P.S. (Oct. 18-30).—Exhibition of Rambling Club Prints.
Partick C.C.—"Gaslight and Bromide Printing." T. Horn.
South Suburban and Catford P.S.—"After Dark." H. Creighton Beckett.

THURSDAY, OCTOBER 19.

Coatbridge Phot. Assoc.—"Bromoil." J. M'Rae.
Hackney Phot. Soc.—Outing to Wanstead Park.
Hammersmith Hampshire House P.S.—"Lourdes." T. H. B. Scott.
Letchworth C.C.—"Bromide Printing." T. P. Brett.
Richmond Camera Club.—Portfolio Evening.
South Glasgow C.C.—Whist Drive.

SATURDAY, OCTOBER 21.

Edge Hill C.C.—Outing to Calderstones.
Hammersmith Hampshire House P.S.—"Night Photography." C. D. Saxton.
Morley Amateur P.S. (October 21-24).—Members' Quarterly Exhibition.
Southampton C.C.—Portsmouth C.C. "At Home."

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday October 10, the President, Mr. W. L. F. Wastell, in the chair. The twenty-fifth annual Traill-Taylor Memorial Lecture was delivered by Dr. Reginald S. Clay, who took as his subject "The Photographic Lens from the Historical Point of View." His discourse was a rapid and highly concentrated review of the development of the photographic lens. It is a large subject, abounding in technicality, and to cover the whole of it from the time of Chevalier's first lenses for Daguerre to the most recent improvements in photographic objectives, called for a degree of condensation which necessarily gave the lecture the form of an amplified chronology. However, Dr. Clay contrived to compress an immense amount of historical matter, particularly in reference to the lenses of the English optical firms within the limits of the time at his disposal. Any report of what he said must inevitably be very incomplete. Some details may be given, and the student of this branch of the history of optics referred to the full text of the paper which is to appear in the November issue of the "Photographic Journal."

Referring briefly to the earliest mention of lenses, Dr. Clay said that glass globes filled with water were known to the ancients for their magnifying power. It was also probable that polished transparent stones or quartz were made use of for magnifying or even as burning glasses. The camera obscura, which was the origin of the photographic camera, was first mentioned by Leonardo da Vinci (1452-1519), who used a pinhole to form the inverted image on a screen. Dr. Clay considered that the first mention of a camera with a lens was made in 1550 by Hieronymus Cardano, but a Venetian nobleman, Daniel Barbaro, in 1568 not only used a lens in his camera, but a diaphragm as well.

Speaking of the achromatic lens, Dr. Clay said that an Englishman, W. Chester More Hall, in 1723, had such a lens made for his private use, but it was incorporated in a telescope some time before Dolland's publication. The evolution of the photographic lens began in 1839 when Daguerre and Fox-Talbot published their discoveries. Daguerre's lens was one of meniscus form working at $f/14$. It was made by Chevalier to Wollaston's formula. The Petzval lens was the outcome of a conversation in 1839 between Prof. A. von Ettinghausen, of Vienna, and Joseph Max Petzval, and was made by Fredrich Voigtländer. This was a wonderful lens, said Dr. Clay, as it had continued to be made in its original form for some seventy years. The aperture of Petzval's original lens was $f/6$, and Andrew Ross made it in an improved form working at $f/4$.

Dr. Clay went on to speak of the doublet lens made of two cemented achromatic lenses by Thos. Ross in 1841. Davidson, who also made a symmetrical doublet in the same year, failed, like Ross, to discover the advantage of this construction in reducing distortion, etc

Dallmeyer's entry into the field was in 1860, when he took out a patent for a separated triplet of which all three components were cemented achromats. The curious panoramic lens of Thomas Sutton, patented in 1859, was next described by the lecturer. It was, he said, a globular shell filled with water. Owing to the variation of the refractive index in the liquid, due to changes of temperature, this was not a great success. Referring to the aplanatic lenses of Steinheil and Dallmeyer, Dr. Clay said that the latter's wide angle rectilinear lens invented in 1866 consisted of two flints, and worked at $f/15$. In 1874 Ross placed upon the market a portable rapid symmetrical lens calculated by F. H. Wenham.

The new glasses of the Schott Glass Works, Jena, proved of great assistance in the development of the photographic lens, and the lecturer proceeded to show how glasses made by combining the three classes of glass, viz., old crown, flint, and new barium crown, could be made to produce a lens which was achromatic, anastigmatic and aplanatic. If two components having these qualities were combined the lens could also be made orthoscopic, and could easily be given a flat field. Speaking of the Concentric lens, the first anastigmat, Dr. Clay said that Schroeder, who was calculator to Messrs. Ross, realised that this lens was not spherically corrected, and proceeded by combination of the two types of crown glass, to construct in 1892 a symmetrical cemented triplet, which overcame the difficulty. This lens was supplied to the Greenwich Observatory for stellar photography, and is still in use there. The Telecentric lens of Ross was calculated by Bfelicke, and had a short back focus. This enabled it to be used in ordinary cameras, especially of the reflex type, and it became very useful for taking sporting photographs. The first lens of this type was made by Martin, but it was not well corrected. The Teleros lens, which was an improved form of Telecentric has just been put on the market and could be made much lighter in weight than the Telecentric.

Speaking of the origin of lenses of the telephoto type, Dr. Clay referred to the patent taken out in 1891 by T. R. Dallmeyer for a telephoto. In 1899 Messrs. Dallmeyer introduced their well-known Adon lens. The Busch Bis-Telar, with fixed separation, appeared in 1905, while the Zeiss Magnar followed in 1906. A new large Adon with a fixed separation and focal length, and made in two sizes with apertures of $f/4.5$ and $f/6$ respectively, appeared in 1912, while in 1919 the Dallon, calculated by Mr. L. B. Booth, was placed on the market. This lens consisted of two cemented pairs, constructed of special glass, and the air space being eliminated, pincushion distortion was reduced to a minimum. Dr. Clay then referred to the uses of lenses by the Air-Force, and remarked that at the outset the 8½-in. focus Ross-Zeiss Tessar was found suitable for the work. However, lenses of longer focus, and in greater number, were soon required, and the "Airo Xpres" of 20-in. focus, working at $f/5.6$, was evolved. Referring to the introduction of the Cooke lens, Dr. Clay said he did not think that the great advance that this type marked was as well appreciated in this country as on the continent. The introduction of this lens formed a starting point for a new method of lens construction, which had had, and would continue to have, many fruitful applications. Mr. H. Dennis Taylor was responsible for the working out of this principle, and patents were taken out in 1893, 1895, and

1898. During the war a special Cooke lens was evolved. This, said Dr. Clay, was the "Aviar," which was designed by Arthur Warmisham. It was a split divergent lens, an idea which originated in the mind of Dennis Taylor, but was never developed; the actual carrying out of the system was left to Mr. Warmisham.

Dr. Clay said he would like to point out that the Zeiss Unar and Tessar were based on the same principles as the Cooke lens, and that he would not be far wrong in saying that nearly all the modern rapid anastigmats were modifications of the Cooke, and built upon the same foundation.

Comparing the Cooke Aviar with a captured Zeiss lens, the lecturer said that Mr. John H. Gear selected as the superior negative the one made with the British lens.

Speaking of the iris diaphragm, Dr. Clay said that one was made in 1816 by Nicéphore Niépce, this was now in the museum of Châlon-sur-Saone. It was, however, Messrs. R. and J. Beck who were the first to fit the iris diaphragm to photographic lenses; this was in 1882, and they were regularly supplied with the Beck rapid rectilinear lens in 1887.

Speaking of earlier forms of lens stops the lecturer referred to the revolving diaphragm of John B. Dancer (1856), which was fitted in front of the lens. Lake Price had inserted diaphragms in a slot in the lens tube, but in 1857 or 1858 Waterhouse "improved the notation," said Dr. Clay, and so gave the system his name.

The Isostigmar lenses were introduced by Messrs. Beck in 1906, and were interesting because they could be made to cover a field of 85 to 90 degrees at f/16, and were thus the first wide angle lens with such an aperture. Messrs. Beck was also responsible for another simple idea, viz., the use of magnifiers in front of a lens. These were introduced in 1894, and were made for the Frena camera. In a final review of the development in the manufacture of lenses since 1840, Dr. Clay said that we first had the wonderful achievement of Petzval, who produced at the first attempt a lens which held its own almost unchanged for more than sixty years. The next step was the invention of the rapid symmetrical lenses of Dallmeyer in 1866, and Steinheil in the same year. These two great inventions in lens manufacture were followed, first by the anastigmats of Hugo Schroeder, Paul Rudolph, and Emil von Hoegh in 1890, 1891 and 1892, following the invention of the barium crown glass of Schott, and finally by the Cooke lens of Dennis Taylor of 1893. In conclusion, Dr. Clay considered that British opticians might claim to have borne their share in the history of lens making in spite of all the praise that has been lavished on the Germans.

A most hearty vote of thanks was accorded to the lecturer on the proposition of Mr. W. B. Ferguson, seconded by Mr. A. C. Banfield. The proceedings ended with the handing to Dr. Clay of the medal struck each year for presentation to the Traill-Taylor lecturer.

CROYDON CAMERA CLUB.

Mr. B. J. Rose opened the formal session with a capital exposition entitled, "Photographic Odds and Ends," mainly of constructional order and mostly requiring diagrams to describe. He started, he said, under difficulties, having experienced three misadventures. The first was suddenly advanced from March next to the opening night by an imperious secretary; the second had reference to his son, who had assisted by bringing the wrong bag of materials, and had been requested to return home for the right one; and the third arose out of an encounter with a wasp (since deceased), which necessitated a bandaged hand. Nevertheless, despite these trials and tribulations Mr. Rose did right well, and was as ingenious as ever.

Contorted portraits, first shown, caused considerable amusement, and are simply produced. A piece of card is bent into a half-circle and retained in position by glued on pieces. Paper side-runners permit of a bromide print being retained in the same curvature and photographed *in situ*. Concavity and convexity towards the lens respectively introduce different effects, and further variation is afforded by placing the curved cardboards with the plane of the circle either horizontal or vertical. The radius of the half-circle used was 2 inches, and in practice a little less than a half-circle is employed. Naturally, a small stop is demanded when making the negative. He suggested by employing much larger radii unduly long faces might be slightly broadened and vice versa, and be more acceptable to the sitter than a faithful representation.

Next came pinholes. A fitment for a camera front consisted of a sliding piece carrying pinholes of varying diameters, any one of which could be used at will. The largest hole was $\frac{1}{8}$ in. in diameter to permit of focussing, and also of the insertion of a narrow rod graduated in inches. By putting this against the focussing screen the extension was shown at a glance. A very simple but neat device.

"Intimate Photography" on C. P. Crowther's lines, pushed, possibly, a shade further than this talented advocate of short foci lenses would approve, was strikingly exemplified by a pinhole portrait of the lecturer, the pinhole during exposure being exactly 6 in. distant from the face. A photograph made by this means fully demonstrated the importance of the nose, even all indications of character were emphasised, though the pose is less than three-quarter face. As a member observed, much unchristian satisfaction would be felt by bashing such a nose.

But joking apart, the photograph was instructive in one respect in showing that in portraiture a near viewpoint *per se* affords no suggestion of stereoscopy. With a large aperture lens the case is entirely different, as the nearer the approach the more it sees round the corner, so to speak, and pseudo-stereoscopic relief is induced, often to a startling degree.

Tips on making many other appliances followed, the demonstration being brought to a conclusion with a consideration of photographic Christmas cards. A device in connection with the last may be useful to many. Frequently it is desired to set off a diagram or drawing, but carbon paper is out of the question owing to its greasy nature, which repels ink. In lieu thereof Mr. Rose takes a sheet of tissue paper, rubs over it a block of Nixey's blacklead, removes as much lead as possible with a rag, and the substitute is complete. Set off lines are plainly visible, and can be removed if required with india-rubber.

Mr. Sellors bitterly remarked that some years ago, like the silly ass he was (cheers), he started making Christmas cards, which were welcomed with a chorus of praise by the household. They were absorbed not by the dozen, but by the gross, till the gross grew into a ghastly nightmare. Never again! Mr. Rose, in reply, was understood to say that he went in for mass production, which involved but little trouble. One simply chucked the gaslight papers into the printing frame one after the other (which is not unusual) and then chucked them into the developer, hypo bath, and washing water, and there you were. "In future I am not," said Mr. Sellors with grim determination.

EDINBURGH SOCIETY OF PROFESSIONAL PHOTOGRAPHERS.

Meeting held at 116, Hanover Street, Edinburgh, on Monday, October 2, at 8 p.m. Present Miss Bertram, Messrs. J. Campbell Harper, Norman Thomson, George Ayton, George Balmain, Swan Watson, J. B. Johnston, E. D. Young, W. B. Hislop, G. G. Morrison, and George M. Aikman, Mr. J. Campbell Harper, the President, in the chair.

In welcoming the members at the first meeting of the session, the President stated that during the recess he had been considering very seriously some useful and permanent work which the Society, as well as its individual members, might do to make themselves a more vital and effective force in the world and in business. He was of opinion that what was required was simply more courage and determination to carry out the schemes and build some of the castles which, up till now, have only been "in the air." Lack of courage and the dead-weight of fear of unsatisfactory results in new schemes must be got rid of, if the Society and its members were to succeed. He stated that it was said that artists are born, and not made, but he maintained that the art world is composed more of men who have made themselves artists by courage and determination with years of training. He was anxious that the Society should attain a higher level, and should zealously pursue the carrying out of their schemes. He thought there were many things the Society could do if the members attended and had the courage to express their opinions. He suggested that the question of electric light charges should be investigated, and he also strongly recommended the holding of a congress and exhibition in Edinburgh as a great stimulant towards raising the status of the professional photographer and the quality of his work. It is essential that every grade of work should be included in the exhibition, as was done in the International Exhibition which was held in London last month. He considered such an exhibition one of the most encouraging and interesting things from a professional photographer's point of view.

The Secretary read the report on the instructive and appreciative lecture delivered by Mr. Lawrence, of Messrs. Kodak, Ltd., in Edinburgh last week, which was approved.

Mr. Young stated that the classes for posing and composition and retouching would commence in the College of Art this week, and he urged master photographers to endeavour to get their assistants to join one or other of the classes, especially the retouching class, as it was most important that every assistant, who is to be of any use to his employer, should have a training in drawing. The President intimated that Mr. Hoskins had been appointed teacher of practical chemistry and optics in place of Mr. Hislop. He stated he had had an interview with him, and he thought he would make an excellent teacher, and he asked the members for their support to the class.

It was agreed to hold an informal meeting in the Victoria Café on Monday, October 16, at 8 o'clock, to discuss as to holding a congress and exhibition in Edinburgh.

A discussion took place on the question of the affiliation of the Society with the Professional Photographers' Association, London. Some of the members felt that nothing was to be lost but much was to be gained by becoming affiliated to the P.P.A., while other members considered that this Society would lose its independence by becoming affiliated. It was resolved to discuss the matter further at the informal meeting to be held this month.

Mr. Young brought before the meeting a pamphlet on a method of class study in the course upon "Appreciation of Fine Arts," written and conducted by Mr. F. C. Tilney. He said that from the statement the course appeared to be most helpful to professional photographers, and suggested that a number of the members should combine and take the course. It was agreed to bring the matter before the next informal meeting, when it was hoped there would be a larger attendance.

A vote of thanks to the chairman concluded the business.

News and Notes.

The Liverpool Amateur Photographic Association has been very kindly lent the extraordinarily fine "Camera Portraits" by Mr. Walter Stoneman, F.R.P.S. A House Exhibition such as this of work of such high technical merit and of such a unique gathering of famous people is very much appreciated by photographers and others living far from London.

Richmond Camera Club.—This old established society, whose headquarters are at the Cottage, Public Library, Richmond Green, sends us its syllabus for the session October, 1922, to May, 1923. Many well-known names are included in the list of lecturers, and their subjects show much variety. We predict an interesting and instructing session for the members.

Postcard Printing.—The London and Provincial Photographic Service have removed to more commodious premises at 97, London Road, Leicester. This firm are making a specialty of high-class postcard work, and send us specimens of their cards in black and sepia. These are extremely well done, and at the low prices charged should command good business.

The Western Australian Camera Club.—The fifth annual report and statements of account for the year ending June 30, 1922, has just reached us. The club is undoubtedly in a very healthy condition, both financially and as regards membership, the number of the latter now reaching 118. The exhibition of members' work, which was held November 21 to 26, 1921, was eminently successful, and attracted many visitors, 250 prints being hung. The committee of management elected on August 31, is a particularly strong one, consisting of keen energetic members, who should help to further the success of the Club.

Photographic Golfing Society.—The autumn meeting of the Golfing Society, which draws its membership from photographic trade circles, was held last week in Norfolk, the headquarters being the Links Hotel, West Runton. There was a representative attendance of members of the photographic trade, as shown by the group photographed by Mr. H. H. Tansley, of Sheringham. Reading from

Photograph by H. H. Tansley.

The Photographic Golfing Society. Autumn Meeting at West Runton.

left to right the members of the industry included in the group are as follows:—Front row: T. M. Illingworth, J. M. Isaacs, S. Adamson, Frank Butcher, Fred T. Butcher, and C. Stanley Houghton. Middle row: J. J. Shepherd, E. W. Houghton, J. Harrington (Sydney), Gerald M. Bishop, C. S. Downing (with challenge shield), Major D. Geddes, E. Smith, Arthur C. Brookes. Back row: C. E. Case, F. W. Greenwood, A. J. Child, J. W. Thompson, W. E. Mitchell, A. W. Brookes, J. S. Boyesen, A. H. Starnes, W. H. Burditt, W. F. Butcher.

The Northern Exhibition.—The tenth Northern Exhibition of Photography is announced to be held from February 5 to March 3 in the City Art Gallery, Manchester. The exhibition will be divided into four sections, comprising pictorial photographs in monochrome or colour, lantern slides, colour slides, Autochromes etc., and natural history and scientific photography. Fifteen awards will be at the disposal of the judges, and will be in the form of decorative plaques. The pictorial section will be judged by Messrs. F. C. Tilney and J. Dudley Johnston, and the technical and scientific sections by Dr. G. H. Rodman. The prospectus and entry forms are now available and may be obtained from Mr. Walter Johnson, 30, Hartingdon, Road, Chorlton-cum-Hardy, Manchester.

Cameras for Photographing Moving Objects.—In a patent specification, No. 184,189, not yet accepted, of H. L. Cooke, 148 Mercer Street, Princeton, New Jersey, a camera for taking photo

graphs from a moving body is described. The camera is so mounted that it can be moved continuously to compensate for the apparent motion of the object to be photographed, and may be used on aircraft, motor car, ship or train. In the form described, a camera is mounted together with a telescope and a gyrostat in gimbal rings, the axes of the three instruments being parallel, and the centre of gravity of the entire movable system being situated at the intersection of the gimbal ring axes. Adjustable torques are applied to the gimbal ring axes by adjustable springs, to produce a gyrostatic precession of the entire movable system in the desired direction and at the desired speed. Time exposures are thus rendered practicable, and the camera may be fitted with a wide-angle lens.

Art Study for Photographers.—During the summer months, when the ordinary activities were suspended, the Pictorial Group of the Royal Photographic Society formed a circle to study the course of lessons in the Appreciation of the Fine Arts devised by Mr. F. C Tilney. It proved eminently successful, and should mark the beginning of a more serious appreciation of the problems of the graphic arts which are involved in photography as well as in the arts of painting and other graphic media. Photographers are apt to imagine that technical skill in photographic manipulations is all that is required for pictorial success, unaware, apparently, that as an art medium, photography is conditioned by precisely the same considerations that apply to the other arts. On this point the course of lessons proved of inestimable value. They are loaded with information which the ordinary photographer seldom takes the trouble to absorb. That is to say, they are designed for the lover of art, whether he be a photographer or not. Of their value to the camera pictorialist there can be no doubt, and if any of our photographic societies can find twenty-one members sufficiently in earnest to subscribe their four shillings (or fewer at the proportional higher rate) and tackle the lessons seriously, the standard of pictorial work will undoubtedly be greatly improved. Club secretaries please note. Full information can be had from Mr. F. C. Tilney, Walden, Cheam, Surrey.

Correspondence.

**** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE 1923 P.P.A. CONGRESS.

To the Editors.

Gentlemen,—We want what we want, when we want it, exactly, and we want the congress held in the spring, when we have left the trying time of winter months behind, and can spare a few days, and an evening or two, without much trouble. Looking forward to the best season we have had, and the fellows we meet, the things that we see, the things that we hear, are conducive to that optimist feeling, that is so necessary; but September! of all months! The wonder is that 298 got there. I can only surmise that the majority must be of the favoured few, with long purses, or their businesses under the control of assistants. Last month it took me all my time to wangle a Thursday afternoon.

Faithfully yours,

James W. Carrick

540, Green Street, Upton Park, London, E.
October 7.

To the Editors.

Gentlemen,—I have seen Mr. James Speight's letter which appeared in your last issue. May I be allowed to remind all members of the P.P.A. that any suggestions or complaints they have to make, will, if addressed to the Secretary receive every attention and consideration. The Council are quite as anxious to carry out the wishes of the members when conveyed to them direct, as they are when their attention is called to them through the medium of the Press.—Yours faithfully,

Alfred Ellis, Secretary.

2, Vinery Villas, Hanover Gate,
London, N.W.8.
October 9.

To the Editors

Gentlemen,—I was very pleased to see the letter from Mr. James Speight and entirely agree with him. I have been a member of the P.P.A. since its formation and attended every Congress except the last, and when the suggestion was first made of holding the Congress in September I wrote you a letter protesting against the alteration, but not a single member backed me up. The small attendance, however, shows very well that a mistake has been made, and I hope the Council will see their way clear to arrange the time to coincide with the Photographic Fair.—Yours faithfully,

Fred Gegg.

Corinium House Studio, Evesham,
October 9.

To the Editors.

Gentlemen,—Your correspondent has admirably and fully expressed the opinion of a good many provincial members, who, like myself, are quite unable to attend an autumn congress. It may be very convenient for those living in or near London, but it is not so for us country members. I have always enjoyed attending the May meeting and seeing a good show of apparatus and materials, but shall be debarred for the future unless a vote is taken as suggested and the arrangement possibly altered. I trust that will be done and the country members given a chance.—Yours truly,

A Staffordshire Member.

To the Editors.

Gentlemen,—I would like to support Mr. James Speight's suggestion that a referendum of members be taken re the September Congress. To me it seems a great pity to have it apart from the date of the Photographic Fair, and the time of year must certainly be awkward for a great many. Besides the children going back to boarding schools (a big business) there are a lot of weddings in September which cannot be missed, also it is so close on one's summer holiday. I had written for my badge but could not get to the recent Congress, and would not like to risk a week away at this time of the year. Of course if September suits the majority, well and good, but some of us would like to know that we are in the minority.—Yours faithfully,

T. Everitt Innes.

The Studio, St. Petersgate, Stockport,
October 9

Photographs by Wireless.—A special article in the "Daily Chronicle" last week dealt in an interesting manner with some of the latest developments in the sending of photographs by wireless. It was stated that in the research laboratory of the General Radio Co., at their Twyford Abbey Works, photographs have already been received by radio, and though the invention is not yet beyond the experimental stage, remarkable results have already been obtained. Those who have seen the radiographs say the pictures are quite good, and generally recognisable. Though the main criticism is that the clarity of the pictures leaves room for improvement, this will be remedied in time. The fact remains that wirelessed pictures are an actuality to-day. The pictures which have been received by the General Radio Co. are wirelessed direct on to a specially made sensitive celluloid film, which is afterward developed. It was only in 1905 that the success of Professor Korn, of Munich University, in telegraphing portraits was heralded as a marvellous invention. He then claimed to have transmitted photographs over a resistance equivalent to more than 5,000 miles. In 1907 pictures were cabled by newspapers as experiments, the process being rather complicated and costly. Since the armistice the most notable enterprise has been the cabling of pictures across the Atlantic in 1920, thus demonstrating in certain circumstances the value of the invention either in newspaper hands or in criminal investigation. By means of a luminous circular plate, against which photographs were projected, pictures were telephoned in the same year from Antwerp to Paris in eight minutes. Mr. Thorwald Anderson, a Dutch inventor, has claimed to have improved upon this method by coding pictures to this country by cable. Mr. T. Thorne Baker has also been working for some years upon sending pictures by wireless, and two years ago he claimed to have an improved system. Now the wireless picture, as Senator Marconi prophesied, has arrived, and, though the greatest secrecy is being maintained by the officials of the General Radio Co., it is known that the method of direct radio photograph transmission is such an improvement on previous efforts that its appearance as a commercial project is shortly anticipated.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

A. D.—Black and white powder colours, as used for finishing enlargements, may be obtained from Messrs. Reeves and Sons, 4, Farringdon Avenue, London, E.C.4. The airbrush would be the best means of covering the background in your print, but if this is not available oil colours may be used. These may also be obtained from Messrs. Reeves, as above.

W. K.—We have no further information than that contained in the specification. No doubt the inventor, M. C. E. Bredon, 44, Rue de Cambrai, Paris, would be glad to give you further particulars. We do not imagine that exposure would be more rapid than in other one-exposure cameras of simpler construction, such as that of Mr. E. T. Butler, which is upon the market here.

Electric.—We should advise you to do away with the Jupiter lamp and in its place fix a half-watt bulb of 2,000 c.p. fitted with a Barkay reflector. A standard lamp of 3,000 c.p. should also be provided. This would enable you to control the lighting, as the lamp could be moved into any position. The General Electric Co., Magnet House, Kingsway, London, W.C.2, make a specialty of studio lighting, and their catalogue would be of use to you.

B. M.—Possibly the prints are not fully toned. This would account for a certain amount of weakening, but not of bleaching. We suppose you are using an ordinary fixing bath of plain hypo, with not more than 2 or 3 ozs. of hypo per 20 ozs. of water. If stronger than this, or if the bath contains additions, such as acid, alum, etc., there is a certain liability to reduce the depth of the prints, though not to the extent of bleaching them. So far as we know, there is no means of restoring the depth of P.O.P. prints which have been bleached in the fixing bath.

A. S.—You cannot do better than use half-watt lamps in your studio. These, if fitted with Barkay reflectors, will be very efficient. The General Electric Co., Magnet House, Kingsway, London, W.C.2, would give you particulars of their studio lighting outfits. The Barkay reflectors may be obtained from W. J. Bartholomew and Co., 40, Gerrard Street, London, W.1. The lens and camera depend entirely upon the amount of money you are prepared to expend. We should advise you to consult the professional price lists of the well-known apparatus makers. You will have no difficulty in getting full length figures in your studio using an 8¼-in. focus lens on a half-plate.

T. W.—(1) A fair amount of practical work in both studio and dark-room is absolutely necessary. Text-book instruction is very useful, but the practical knowledge is the principal thing. (2) "Science and Practice of Photography," by Chapman Jones, is a volume which should suit you. It is now out of print, but may be obtained (second-hand) from Messrs. Foyle, 121-123, Charing Cross Road, London, W.C.2. For illustrations of apparatus we would refer you to the "British Journal Almanac," where many advertisements of cameras and other accessories are given. (3) Messrs. Jonathan Fallowfield, Ltd., 146, Charing Cross Road, London, W.C.2, make a specialty of "while-you-wait" photography, and would give you particulars of the apparatus, etc., needed. The "British Journal Almanac" gives particulars of all the most up-to-date processes and apparatus used in photography, together with formulæ and working details.

J. T.—The stains in your films are due to insufficient fixation, while the white powdery deposit on the surface is due either to the wash water containing a large proportion of lime, or to the films not having been sufficiently washed. We should advise you to soak the films in strong hypo solution, say 6 ozs. hypo to 1 pint water. They may be left in this solution for 10 minutes, but should be watched carefully. If this does not remove the stain, probably thiocarbamide may be of use. Make up the following :—

Thiocarbamide	90 grs.
Citric acid	90 ,,
Water	20 ozs.

Wash the films very thoroughly to remove hypo and carefully wipe each side with wet cotton wool before placing them in this bath. A few minutes only may be necessary to remove the stain, but we are afraid you will not completely clear your films as the stain seems to be of fairly old standing.

Skipress.—You will find some useful hints on engineering photography in the little book "Commercial Photography," issued by our publishers, price 1s. 3d. post free. The only other book on commercial photography, including that of engineering subjects, is a very excellent American manual, "The Commercial Photographer," published by F. V. Chambers, 636, South Franklin Square, Philadelphia, U.S.A., price 4 dollars. You would have to send direct for it. The best book on retouching is Johnsons "Retouching," by Bruce and Braithwaite, for which our publishers are special agents, price 5s. 4d. post free. We advise you to get a camera of the square bellows or slightly taper pattern. For such work you want at least two lenses, namely, a wide-angle of about 5 inches focus and an anastigmat doublet of 8 or 9 inches focus. The latter need not be one of the ultra-rapid $f/4$ lenses, but is better one of the $f/6.8$ or $f/7$, which is listed by most of the leading makers. A lens of this type is better for covering the plate when the lens front is raised.

M. M. L.—It would be impracticable to obtain a light sufficiently intense for studio portraiture from dry batteries, accumulators, or similar electric storage apparatus. In your circumstances we think you have no alternative between flashlight and incandescent gas. The latter has the same defects as the petrol light you are using, namely, not enough light and too much heat, but the best of these gas installations, the "Howellite," of Messrs. J. J. Griffin & Sons, Ltd., Kemble Street, Kingsway, London, W.C.2, suffices for exposures of, say, 4 or 5 seconds on a fast plate with an $f/4$ lens. As regards flashlight, it would be absolutely necessary to fit up a big chamber to carry off the smoke. Although this form of light is scarcely used in this country, it is largely adopted in France and in America, where portrait photographers have been to a good deal of trouble in fitting up smoke cabinets as part of the studio. Of the two, we should think you would do best with flashlight, and if that is so, it may be of service to you to mention the name of Mr. D. Charles, 50, Webb's Road, Clapham Junction, London, S.W.11, who is a good man to draw up for you, and supply, if necessary, a specification as regards the design and fitting of a smoke chamber and ignition of the powder.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. Established 1854. PRICE FOURPENCE.

TERMS OF SUBSCRIPTION POST FREE.

United Kingdom or Canada.—*One Year*, £1 1s. 8d.; *Six Months*, 10s. 10d.; *Three Months*, 5s. 5d.

Any Other Part of the World.	*One Year*	£1 3s. 10d.
	Six Months ...	12s. 0d.
	Three Months	6s. 0d.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibits the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

Henry Greenwood & Co., Ltd., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3259. Vol. LXIX. FRIDAY, OCTOBER 20, 1922. Price Fourpence.

Contents.

SUMMARY.

In a contributed article Mr. A. H. Hall makes some suggestions for obtaining greater depth of tone in prints. Among other methods he mentions the use of smooth baryta-coated paper as the transfer paper in carbon printing, and also the application and subsequent printing of a film of bichromated gelatine. (P. 633.)

In a recent paper in "American Photography," Mr. E. J. Wall sets forth the chemical relation which the alkali in a developing solution bears to the developing agent proper, and from these considerations evolves a table showing the developing equivalents of the various alkalies. (P. 634.)

In his paper this week, Mr. J. Effel has some more things to say on the part which psychology plays in the conduct of a portrait studio. (P. 631.)

In a leading article, we consider the practice of portraiture in ordinary rooms in relation to the fashion for unorthodox lightings which has been created by the spotlight and other means. (P. 630.)

Several correspondents return to the subject of the time of year for the next Congress of the Professional Photographers' Association, and express the view that a referendum should be taken among the membership. (P. 643.)

Commercial makers of photographs for advertisements may well consider the greater favour which is being bestowed on soft-focus effects by advertisers of taste. (P. 629.)

Condensation of moisture on lenses is not limited to their outdoor use in bad weather, but occurs even in studios, particularly during the winter season with its variations of temperature. (P. 630.)

The advantages of the auxiliary spot light for the production of distinctive effects and also in supplement to daylight are the subject of a paragraph on page 629.

At the Royal Photographic Society on Tuesday evening last Major F. C. V. Laws, R.A.F., in a lecture on the progress of aerial photography, gave instances of the remarkable improvement in the technique of aerial-photographic methods, and described some recent important applications of aerial photography. (P. 640.)

By optical copying of an opaque negative in place of contact printing from one on a transparent support economy of material can be effected, although at some sacrifice of quality. (P. 630.)

The misuse of the dark-room towel is perhaps more largely responsible for chemical contamination than any other cause. (P. 630.)

The preventible causes of blisters on prints are described in the current issue of the American "Studio Light." (P. 636.)

A process of sensitising resin with bichromate is the subject of a recent patent specification. (P. 637.)

Ex Cathedra.

Soft-Focus Commercial Work. In this country it is almost invariably the practice to use absolutely sharp photographs for newspaper and magazine advertisements. This is doubtless due to the fact that it is generally considered necessary to work up the prints liberally in body colour before handing them to the process-man. This is obviously out of the question with photographs made with lenses giving pronounced diffusion. On the other side of the Atlantic soft-focus pictures are now becoming quite a feature in the advertising pages, particularly of such periodicals as use the rotary photogravure process. The effect is rather pleasing, and doubtless often attracts the cultured eye when the usual brilliant result upon heavily-glazed paper would be passed over. It is noteworthy, and should be suggestive to some of our workers in this branch, that in many cases the advertised article is not made prominent; its presence is unnoticed until the accompanying type matter has been read, when the advertising appeal becomes insistent by reason of its very reticence.

* * *

The Spotlight in the Studio. The exhibition of professional portraiture at the Congress of the P.P.A. last month, and also the portraits included in the Salon and Royal Photographic Society's show, have demonstrated the desirability of using some style of spotlight for obtaining special effects of lighting. The ordinary studio lighting, whether it be daylight or artificial light, falls short of the requirements in this direction, and only the more general effects may be obtained. It is quite possible to control all lighting in the studio, by means of shades or reflectors and by the position of lamps or windows, but the more appreciated effects are difficult, unless some special apparatus is to hand. The general form of spotlight now offered for studio use owes, perhaps, its success to the effects obtained by it in cinema work, but while these effects are largely of a theatrical kind, there is no doubt that in skilful hands this method of lighting can be extremely useful in the portrait studio. The spotlight, as now placed upon the market, consists of a metal body containing the electric lamp and reflector, mounted on a sliding tray. In front of this is placed a convex condenser, and by aid of the sliding tray the beam of light can be increased or decreased in covering power. A small spot can be focussed upon the object it is desired to illuminate, or a flood of light can be spread over a large area. The lamps are usually light in construction, and therefore very portable, and can thus be moved with a minimum of trouble to any part of the studio. Various diffusing devices are obtainable for use with these lamps, and colour filters may also be used to tone down the beam to any desired amount. This type of lamp is equally useful to the professional who relies only upon daylight, for by its aid accentuated lighting effects can

be obtained, and shadows, often difficult to illuminate by reflected light, can easily be made more luminous. Moreover, the price of most of these lamps is quite reasonable, and places the accessory within the reach of all.

* * *

Opaque Negatives. Some months ago we inspected an installation for making bromide enlargements, in which the ordinary glass or film negative was eliminated and replaced by a bromide paper negative "print" which had been copied from the original positive print. This was in its turn re-photographed to the desired size upon bromide paper, the final result being, of course, a positive. While it can hardly be expected that an equally good range of tones can be produced by this method when compared with the usual one of using a transparent negative, there are circumstances in which the idea might be profitably employed. Given a series of much under-exposed negatives, these, if free from fog, might be used for the production of prints on any scale without the labour involved in the plan usually recommended of bleaching with mercury so as to produce a positive image, and from that making an ordinary negative. It is, of course, understood that this procedure is only recommended for images which are too feeble to give a printing density by any of the usual methods of intensification.

* * *

The Lens Surface. Lenses are not cheap to buy, and extra rapid anastigmats are not the cheapest of lenses, hence it is rather surprising that so little thought is exercised over their preservation. Not a few good lenses are now suffering from that iridescent appearance upon their surfaces which is an indication that a slight corrosion of the glass has set in, a warning which, if not heeded, will result in a much more serious deterioration. We have noticed this to occur chiefly to lenses which are left permanently on the camera, as is the case with Press and many studio cameras; it is rarely seen upon a lens which is removed from the camera and put away in a case or bag. It is not wise to expose any lens to a damp atmosphere or to a strong light unnecessarily. Lenses which are left upon cameras should be fitted with closely-fitting caps, and in the case of studio lenses, both back and front lenses should be so protected. The temperature of most studios varies within a wide range during a day and night, especially in autumn and winter, and with these changes there is grave risk of moisture being condensed upon the glass. One night may do little harm, but a hundred nights will do much.

* * *

The Dark-Room Towel. Observations of a number of dark-room methods lead us to repeat some warning notes, which have already been given many times. We refer to carelessness over spilled solutions. Very often the same cloth is used to mop up spilled hypo and spilled developer, and then to wipe the photographer's fingers between operations. And, instead of being removed from the dark-room, washed and dried, the cloth is left hanging near the developing bench. When dry, it contains a deposit of tiny crystals left by the evaporated solutions, capable of floating into every cranny and crack of the dark-room. The cloth needs only to be picked up and put down again to start hundreds of these crystals on their ways into most unlikely places. These afterwards give rise to all sorts of markings on plates and papers, for which, very often, the manufacturers get the blame. Solutions spilled, however small the quantity, should never be given a chance to dry up; they should be thoroughly mopped up at once, and, when it is necessary to wipe the fingers, this should be done with something which does not contain a kind of cocktail of all the solutions used. Otherwise, faults due to contamination are sure to make their appearance.

PORTRAITURE IN A SITTING ROOM.

WHILE it continues most difficult to find premises suitable for portrait work, without paying an enormous rent or going to considerable expense in building or alterations, the young photographer who has finished his (or her) novitiate, and is anxious to make a start, or the old hand who wishes to open a branch in a new neighbourhood, is often deterred from taking premises in a desirable position by the fear that it will be impossible to do good work without something approaching an ordinary studio light. Curiously enough it is the man with studio experience who is most affected in this way. There are few rooms which have not enough light for portrait work. Twelve square feet of glass will suffice for most purposes if the room is large enough to permit of free movement of the camera and sitter. In such rooms it is not usually practicable to take full lengths by daylight, but nearly all bust and half-length work can be undertaken with success.

Not only the size and position of the window have to be considered, but the nature of the outside surroundings. Bushes, trees and other buildings if near a window may entirely destroy its value for portraiture, so that no room should be chosen before sitting in the positions which would be occupied by the model and noting the extent of unobscured sky which is visible.

There has lately been a considerable change in our ideas as to portrait lighting. In every exhibition may be seen photographs which outrage all the traditions of Victorian portraiture, and this has made it all the easier for the worker of to-day. One of the cardinal points was the avoidance of two sources of light. Now we have "spot lights" to light the sitter from the back in addition to the ordinary lighting. The worker in rooms need not therefore be hampered by any ideas of orthodoxy in this respect, but is free to seize any effect which may appear attractive in his eyes. Another tradition was that only one window in a room should be used to illuminate the sitter, others being completely blocked out. This, again, has gone by the board. Then, the great increase in plate speed which has been made in the last year or two has greatly simplified photography in ordinary rooms. Formerly it was necessary to work fairly close to the window to secure a reasonably short exposure. Now it is possible to work almost anywhere in a well-lighted room, if the lighting of the sitter be deemed satisfactory.

As the position of a window cannot be changed it is very necessary to provide as much free working space as possible, and to this end every article of furniture or piece of apparatus should be banished, so that the sitter and camera may be moved about easily and without fuss. The utility of this may be proved by taking half-a-dozen negatives of a sitter who does not change her position, the camera being kept at a fixed distance, but moved round in an arc of about ninety degrees, commencing with the lens axis parallel to the window and working round until the lens is pointing nearly into the light. Another set might be taken to show the effect of moving the sitter in a line parallel with the window so as to vary the amount of front and side light, the camera being kept stationary all the time. An experienced

photographer will hardly need to expose plates to realise the variations in lighting, but the beginner will find the exercise a useful one.

The reflector is an important accessory in room portraiture, and it is well to provide two, one five or six feet square, which can be used to give a soft general illumination when placed at a distance from the sitter, and a smaller one, about thirty by forty inches, which can be placed at close quarters for more decided effects. For "spot" light or jazz effects a small swing mirror is sometimes useful. This may be stood upon the floor or on a table and the light directed upon any desired point.

The apparatus for a room studio should be chosen with a view not only to the size of negatives to be produced, but the size of the room in which it is to be used. In most cases a whole-plate camera will be large enough, and unless the repeating back is a fetish it will be better to select the ordinary parallel bellows pattern with double slides. A studio stand is essential, on account of the facility of movement which it gives, but it should be no larger than is absolutely necessary. It is not wise to attempt to work with a solitary lens, particularly if it be of short focus. It is hardly safe to approach nearer to the sitter than five feet, for fear of what is improperly called distortion, and this being the case a sixteen-inch lens will be necessary for a three-inch head upon a whole plate, the distance for this size being sixty-four inches. Sixteen inches is obviously too long for smaller heads and sitting figures, so that another lens, which may have a focal length between nine and eleven inches, is necessary.

If the room studio has lofty windows, say nine or ten feet high, standing figures may be undertaken, but with lower ones it will be necessary to provide some form of artificial light. If current be available, two or three 500-watt gas-filled lamps may be fitted to serve as a top light, and all will be well. Where there is no current, an enclosed flash lamp may be used with advantage. Such lamps are usually fixed upon an adjustable stand so that the light may readily be placed at any desired height.

There is a tendency when working with a small area of light to get hard negatives, but with most rapid plates this may be avoided by curtailing the time of development. Nothing is gained by trying to bring out shadow detail, but much may be lost at the other end of the scale by blocking up high-lights.

WITH A PORTRAITIST IN THE STUDIO.

[The following article continues the notes by Mr. J. Effel on the part which psychology plays in the management of a studio. It is hoped to print some further papers by Mr. Effel. The next one, which should appear next week, will deal with accessories and backgrounds.]

VIII. *(continued)*—THE PSYCHOLOGICAL ASPECT.

There are some portrait photographers who seek to impress their customers by their dress and manner. There are others who do not mean it, but who certainly create impressions that are not pleasing. I must confess that I have found that the public do not care a hang about the photographer's appearance. Frock coat, velvet jacket, long hair may impress a certain class, but nothing counts so much as naturalness and sincerity. Remember it is always the quack in all professions who spends so much time and money in self-advertising. The "typical" photographer is becoming out of date. It goes without saying that the studio worker's manners should be perfect, and that he should have a knowledge of all the little courtesies and evidences of good breeding. I remember years ago being sent as locum to one of the highest class studios in the country. The operator was a pompous sort of chap with a "guid conceit o' himsel'," as they say in Scotland. I had to work with him for one day to get into the way of things before he left on holiday. The dressing-room was on the second, and the studio on the third floor. I found that it was the custom of this operator, when he had a particularly distinguished client, usually a lady of noble family, to bow her out of the dressing-room, and indicating the studio stairs with a fine sweep of his arm to *send the sitter up in front of him*. The humorous part of the business was that my reversal of the procedure threw the reception room into a panic. No doubt they are still acting like ill-bred flunkies at that studio, and the clients are having quiet chuckles at their expense. I am no great stickler for what is ordinarily called etiquette, but the point I wish to make in this connection is that at the very outset of the sitting it was more than likely that the client looked upon the artist as a bounder. And it does not need much psychology to tell us that that is a disastrous beginning.

Whether a photographer is treated with respect or with contumely depends altogether on the individual. I regret to say that the photographer has been sadly lacking in psychology in this respect. I can go over in my mind a dozen of successful photographers, every one of whom is a broad-minded, approachable man, with the social virtues one expects from a good business man and citizen. But there is also a very large class, good enough photographers, and men who could easily fill a better position, but who seem to spend all their spare time in grousing. What most of these grumblers need is Kickology. Just listen to this story for a minute. Mrs. Green has brought her four little children to be photographed by Snapshotte, who advertises himself as a "medalist (one I) for child portraiture." Mrs. Green has made no appointment, she arrives at quarter to one, and the light is bad. Old Snapshotte is in a deuce of a temper. He has been struggling with copies all morning, blaming everyone for losing originals, the paper stop of the copying lens has been torn, and no one can think where he put the scissors. The camera is dismantled of portrait lens, hood, vignetting arrangements, and sundry odd parts, and pulled out to its triple extension. Snappy (that's what the staff and everybody else call him) has just thought about running out for a bit of lunch, and now his receptionist has ushered these people into the dressing-room! The "medalist" is in a paroxysm. That fool, Jones, the general assistant went to his dinner (lunch?) at half-past twelve. Certainly that had been Snapshotte's own idea, but then when it was wet, and the copying not started—dash it all, he would give Jones a bit of his mind. The fellow had nothing in his head, no thought of anything but his dinner. And why didn't that stupid girl in the reception-room have a bit of tact? Why didn't she tell Mrs. Green that the light was too bad for children? It was high time those half-watt lamps were put back in their position; nothing seemed to be done unless he did it himself. Good heavens! there were the children actually wandering into the studio, when he wasn't anything like ready for them. Of

course if he *was* ready, they would take about a year to do up their hair! Mrs. Green has given no definite order; the children are all going to a garden-party, and she thought it a good opportunity when they were in their light clothes to have them photographed. Oh, maybe a group of four, then the two boys together, the two girls, and then some post-cards or cheaper ones of each one separately. The woman didn't seem to know her own mind at all, he would give the receptionist definite instructions that we could not do business in this easy-going fashion. True, he had told her, that when somebody well known came in, that it was better to leave it to his own discretion, and the Greens were wealthy people, and very easy to deal with, but, deuce take it all, look at the light, where has Jones put the screw that keeps the lens from falling out, and why didn't he tack up the Seavey background without waiting to be told? Assistants and customers were a lot of fools, and photography was a damned rotten business, if that woman thinks he can make pictures of her children—he had a good notion to give *her* a bit of his mind——

Now, that picture is not very much overdrawn. I would ask friend Snapshotte to cultivate a sense of proportion, to think how other businesses are conducted, and then ponder over the psychological aspect. In the big store a polite attendant shows customers to the different departments, courtesy is the rule, and on leaving you are asked if your requirements were satisfied. Is it any wonder that Mrs. Green and others of her class enjoy shopping, and dread a visit to the studio of such as our estimable friend, Snapshotte? Photography is a very exacting business, and one that is calculated to try the temper of a saint, but, after all, other folk have their troubles, yet keep their worries from their customers.

I would most certainly say that if the photographer is to give himself the best chance of success, he should establish himself on a friendly footing with the sitter in the first few minutes in the studio. Neither obsequiousness nor patronage will do. Unless a lady can feel quite at her ease and children happy in your premises, you will never be a success as a "portrait specialist." I have no room in my philosophy for the man who fawns and truckles to wealth and position, and treats his poorer clients with lordly condescension. I know that a photographer, like every other man who deals with the public, has to be "all things to all men," but adaptability is a very different thing from snobbishness. The man who makes a practice of leaving all but his richest clients to assistants should advertise the fact in his showcase. I was struck recently on reading an account of Horatio Bottomley's methods with audiences that in the finer perceptions, that otherwise astute showman was lacking in psychology. It appears that he had an elaborate system of grading his oratory according to the profit he was going to receive for his exertions. That was fundamentally unsound. I remember a comedian appearing at a concert where the hall was about a third full. When, after the show, I said something to the effect that the poor house did not seem to detract from his performance, he turned to me and said: "And do you think that I should punish those who *have* come to hear me, for the weather conditions which have kept others away?" Now, that's real psychology, and my actor friend stands high to-day as one who gives every audience his best. Why is Mrs. Smallpurse made to feel that she can only get the attention of an army trainee, when she orders half-a-dozen postcards of little Nellie? She knows jolly well that Snapshotte himself took those pretty pictures of kiddies which she admired in the window. And yet at the end of a bad half-year the Snapshottes will think to improve matters by sending out a few thousand circulars couched in terms of the most flagrant hypocrisy.

One does not require to be much of a character delineator to weigh up the various clients who enter the studio through the dressing-room—that is as far as pleasing with our work is concerned. The business man plainly dressed wants a different picture from the youthful knut, or, as I ought to put it, the smart young fellow should not be taken in a style suitable for a Pa. Roughly speaking, vulgar people want their clothes featured more than those who never wear anything but the best, but a photographer who cannot express admiration for a pretty frock or a tastily dressed child is a lost soul. The other day I came across a booklet sent out by a photographer of repute. It contained several pretty pictures of children, and almost implored patrons to have the little ones taken naked or with very little clothing. Ribbons and bows were to be avoided as inartistic, and the mother would be well advised to leave the arrangement in the capable hands of the man with such an array of awards for his child portraits). For downright folly, and faulty psychology this would be hard to beat. If a lady sends her child in hand-embroidered taffeta, with the latest in shoes and socks, she does not want a picture of a barefooted child in Jæger underwear. It is only the intimates of the family who have the privilege of seeing baby at bath time. Imagine the consternation at a fashionable "at home" if nurse introduced the children in combinations or less! Certainly, if a fond mother wishes to show the little one's beautiful body, that is a different matter, and the photographer should always be on the look-out for pretty, plump children, and can suggest tactfully a drapery picture to the parent. I question if many photographers could pass an examination in colours, fabrics and styles at present current in fashionable clothes. Crêpe-de-chine, sponge cloth, voile, stockingette, jade, rust, champagne, nigger convey nothing to the average male photographer. The same operator would carefully study some erudite treatise on the photographing of repoussé work, and yet not know the difference between a blouse and a jumper, nor bother his head for a second about suitable ways of taking the varying styles of the clients who keep him alive! There seems to be a sad lack of psychology here.

What the mere man must get into his head is that men's fashions may experience a complete change in fifty years, but those of women undergo revolutions in five years, and change from month to month, and what is more important, in these days of the cinema, *every factory lass or shop girl knows each change*. French photographers know more than we do in this respect. The man who fills his case with pictures of ladies in high-waisted robes with V-shaped necks when everybody is wearing frocks with boat-shaped neck, and waist line approaching the knees, will not get customers however "artistic" his work may be intrinsically. Don't tell me that positions are the same although the cut of the clothes is different, for that is not correct. The man who advertised "all the latest positions" was nearer the mark, for the student of dress will know that a lady in crinoline and one in a hobble skirt are different propositions in posing. Our grandmothers did not sit cross legged, but then that attitude would have been as awkward as it would have been thought unbecoming. Yes, let us scrap all out of date specimens, and have the courage of our convictions at the same time, and scrap our out of date ideas.

In conclusion, I would say that it is the business of a photographer to give the public what they want, not what he thinks they ought to get. If he thinks that a certain style or finish, although somewhat different from that which they are accustomed to, would better suit their taste, it is up to him to educate the public; but, after all, a professional photographer is a merchant, not a teacher; besides, it is generally the other way about, for most times it is the artist who will not change enough to suit the public.

Before we can supply our customers with the right goods, and serve them up in the right fashion, a pretty good study of their education, their social position, their artistic tendencies or their ostentatious bearing, is required. No rules can be laid down, but assuredly there is scope for psychology.

J. Effel.

DEPTH OF TONE IN PRINTS.

That the range of gradation of most classes of photographic papers is too limited is evidenced by recent introductions of slow gaslight papers for giving warm black tones, since the makers claim a longer scale of gradation than is found in the other development papers of their manufacture. Though these papers undoubtedly represent a step in the right direction, they are slow, and are not adapted for enlargement purposes except by the large trade firms who have very powerful light installations for dealing with this class of work. It may therefore be useful to examine various methods which may be used for increasing depth in the shadows. Though few of these are commercial, they may have special application in individual cases, it being obvious that any possible increase in scale must start at the point where the shadows begin to be blocked up.

Whatever the merits of the best development papers, it will probably be agreed that a carbon print is unsurpassed for the length of scale it will give, and it may therefore be regarded as the standard. It is, of course, necessary that the carbon print be made on a suitable transfer paper, and it will then be noticed that the depth in the shadows is enhanced by the semi-glossy appearance, due to the deposit of pigment embedded in a considerable amount of gelatine. Those tissues which give a dead matt result have far more pigment in their composition, and though useful in some circumstances, do not exhibit the special feature mentioned and so fall below the standard.

The writer has found that the maximum depth he can get with a carbon print is obtained, when using for the transfer paper, a smooth baryta-coated paper, such as is prepared for some bromide emulsions. The shadows of a good carbon on this paper are quite glossy, and the surface of the high lights is almost matt. Such transfer paper is not obtainable commercially, and it is not easy to prepare without leaving streaks in the coating of insoluble gelatine. Several applications of a weaker solution of chromé alum and gelatine than is usual in preparing transfer papers, is the best method of avoiding these markings.

With development papers various devices have been suggested to prevent the blocked-up shadows which are often apparent in a print which has been fully developed, and generally speaking, it is the platino matt type of paper which exhibits this defect in the most marked degree. Especially is this the case with sulphide-toned prints in this class of paper. The most common method of alleviating this trouble is to rub in an encaustic paste or megilp evenly over the whole surface. Some improvement is certainly effected by this means. A thin spirit varnish applied with care gives similar results, but in both cases the print is apt to show a somewhat greasy appearance. Steaming the print till the gelatine is on the point of melting used to be popular some years ago.

A print which has had a slightly too short exposure, and has been developed to the limit without blocking up the shadows is often much improved by intensification with the well-known bichromate formula, and the writer has recently seen some prints, exhibiting remarkable depth in the mixed chloride and bromide type of paper, which have been treated in this manner, and steamed subsequently until the surface shows a slight gloss.

In a recent number of this journal mention was made of the device of coating the print with an oil pigment which matched the silver image in colour, and removing this coating where accents were required. This procedure is very popular with some pictorial workers, and undoubtedly depth can be enhanced in this way. It would appear, however, that this pigmenting method is more often used to lower the key of the picture than to increase depth, though there is no particular reason why it should be so used, except to satisfy the aspirations of the particular worker.

All the devices mentioned so far, either require the general treatment of the print, or a certain amount of skill in selecting and treating portions of the print in a manner which will not be obvious on inspection.

The methods which follow depend more on photographic than mechanical processes, and in the writer's opinion, include the most effective means of giving depth to the shadows.

The print may be coated with a thin solution of bichromated gelatine; when this coating has been dried in the dark, the print is adjusted in proper register with the negative, and exposed to daylight for a sufficient time to render the gelatine in the shadows insoluble. The soluble gelatine is then washed off in hot water, leaving a deposit in those parts of the print where the light action has been sufficient. When dry, the gelatinised portions, *i.e.* the shadows, will dry with some gloss, while the high lights remain matt.

This method, while quite effective, is limited to contact prints. The same effect can be obtained on any bromide print by the Carbro process. Presumably double transfer paper would be suitable, though the writer has used photo-litho paper, in which the gelatine is more soluble, with complete success. This paper is treated exactly as a piece of pigment plaster would be for the Carbro process, and after fifteen minutes contact with the bromide print the two are placed in water at about 90 deg. F., the photo-litho backing peeled off, and the print developed as usual. On drying, a considerable amount of gelatine will be deposited in the shadows and none in the high lights, and the amount of the deposit can be controlled to a considerable extent by the time of immersion in the No. 2 bath and by the temperature of the water.

The results by this means are distinctly good and an obvious extension of the method is to use a piece of ordinary carbon tissue which will give a coloured deposit, and when the underlying bromide is re-developed the two images will give a print of great depth. Of course the bromide print must not be too dark or the final result will be very heavy, and it is important that the pigment chosen should bear some resemblance to the colour of the bromide print, or double tones may result in the high lights, if the pigment is completely washed away and the silver image re-developed. It is not always easy to avoid the high lights being slightly veiled, however, when the two images are superimposed.

Another method which involves considerable trouble, but is very effective, is to make the original print on a brand of paper suitable for Bromoil. After bleaching in the usual way the print is not fixed out, but is re-developed, and after a brief washing, is treated as if for Bromoil by pigmenting those parts which require strengthening, leaving the other portions of the print alone.

It is, of course, obvious that the pigment used must match the colour of the print, and the portions which have been pigmented should be finished with a fine brush, if necessary slightly moistened with petrol, to eliminate the grain. Any parts which has received unwanted pigment can easily be cleaned with rubber when the print is quite dry. Granted the necessary skill to pigment without showing obvious grain, there are great possibilities in this procedure.

A. H. Hall.

The City Sale and Exchange, of 81, Aldersgate Street, London, E.C.1, send us their sale catalogue of photographic apparatus. The sale is open until October 31, and some remarkable bargains are offered. Lenses, suitable for portrait work, are a special feature, while many types of cameras for field or studio are offered at very favourable prices.

THE ALKALIES IN DEVELOPMENT.

[In a recent issue of "American Photography" Mr. E. J. Wall has the following paper, in which is considered the action of the various alkalies in development from a standpoint which is largely neglected, namely, that of the relationship of the alkali to the chemical properties of the particular developing agent. The present paper explains the function of the alkali in a developer in a way which can be readily understood even by those with a very moderate acquaintance with chemical matters.]

Probably few recognise that alkaline development was discovered sixty years ago, more than twenty years before the first gelatine dry plate was made, and that pyro-ammonia was used. This was a great advance over the old acid developers and it differs entirely in its action. With the old iron or pyro-plus-silver developers, we had what is called physical development, in which, practically, the light-affected silver salts were not in themselves reduced, but merely acted as germs or nuclei for the deposition of the nascent metallic silver of the developer, which was deposited on the top of the film. With alkaline developers, the light-struck silver salt is itself reduced and the image is formed in the thickness of the vehicle, there being no free silver nitrate or other salt to form the nascent silver.

It is not going too far to ascribe some of the merit of the discovery of the alkaline developers to an American, E. Anthony, of the well-known firm E. and H. T. Anthony, the predecessors of the Ansco Co. He stated in 1861, that the speed of a bath collodion plate could be increased by fuming it with ammonia prior to exposure. Then Wardley suggested the use of a neutral solution of pyrogallol, and Leahy and Russell almost simultaneously discovered the action of alkaline pyro, which could have been a logical outcome of Anthony's suggestion.

At the present time one may say that, with the exception of amidol, and like developing agents, an acid developer is never used, and probably even with these the hydrolysis of the sulphite, which is always used with them, furnishes the sodium to form the phenolates that are the actual reducing agents.

Unfortunately we are accustomed to use the term "developer" not only for the real reducing agent, but also for the solutions as a whole, which sometimes leads to a little confusion or doubt.

As a legacy from the early days of the dry collodion plate and collodion emulsion, ammonia was the first alkali used, and though it persisted for many years, it has now fallen into almost complete disuse, except with colour screen-plates, so that it is not worth while to discuss it. Its disrepute is founded on the fact that it is very volatile and therefore the developer is constantly changing, and to the fact that but very few experiments have been recorded of the use of ammonia with the newer developing agents, in which we may include every one except pyrogallol.

Of the fixed alkalies we have the carbonates and the hydroxides, usually called the caustics, of potassium and sodium. It may be as well to try and give a sketch of the part played by the alkali in development, and this may be briefly represented by the following equation :—

$$2AgBr+2Na_2CO_3+H_2O=2Ag+2NaBr+2NaHCO_3+O$$

Or putting this into words, the bromine set free from the exposed silver bromide combines with some of the sodium carbonate to form sodium bromide and sodium bicarbonate, which are restrainers, while oxygen is set free, this molecule of oxygen being taken up by the developing agent. If this last reaction does not take place there is no development, for it is the capacity of the developing agent for oxidation that starts the reduction of the silver, and the alkalies accelerate the action.

The carbonates are the most generally used salts, and it is generally assumed that the potassium carbonate gives greater density than the corresponding sodium salt. Actually it gives a little more rapid development. It has fallen into considerable disuse because of its higher price and its proneness to deliquesce, or absorb water from the air. The sodium carbonate is the more generally used.

There are actually three carbonates of sodium; the bicarbonate or acid carbonate, $NaHCO_3$, the sesquicarbonate, $Na_2CO_3.2NaHCO_3.3H_2O$, both of which are practically useless for development, and the normal sodium carbonate. This is the salt actually used and it exists in three forms: the crystalline, or decahydrate, $Na_2CO_3.10\ H_2O$, the monohydrate $Na_2CO_3.H_2O$, and the anhydrous salt Na_2CO_3.

If we place under these formulæ their molecular weights we shall easily see what relation they bear to one another :—

$Na_2(CO_3).(10H_2O)$
$46+60+180=286$
$Na_2(CO_3).(H_2O)$
$46+60+18=124$
$Na_2(CO_3)$
$46+60=106$

Therefore, it is clear that if we use the crystalline salt, we are actually paying for and using nearly two-thirds of water.

In most formulae we meet with the term "anhydrous," whereas as a matter of fact the true anhydrous salt is rarely used, the photographic desiccated soda being the monohydrate. It is generally assumed, too, that this is double the strength of the crystalline salt, but actually it is stronger, in the ratio 286 : 124, or 100 : 43.4. But we shall not make a very grave error if we assume that the desiccated soda is double the strength. For instance, taking a typical developer containing 5 per cent. of crystallised carbonate; it contains approximately 25 grains per ounce of solution. Then, if we use half the quantity of the dry salt, the error will be under 2 grains per ounce. This excess is negligible and may well be within the error of weighing.

The dry salt has the advantage over the crystalline, besides not taking up so much room, of being more stable, as it is not so likely to effloresce, or lose its water of crystallisation. It should be noted that commercial carbonate, if not properly kept, almost always contains some of the bicarbonate, as it absorbs carbon dioxide from the air along with moisture. After thirteen days exposure to the air it may contain as much as 15 to 20 per cent. of bicarbonate, which is useless for developing. It is obvious, also, that the crystalline salt is much more prone to this decomposition than the desiccated, because of its richness in water (H. Dubovitz, "Chem. Ztg.," 1921, *45*, 890).

The quantity of carbonate to be used with a given developer varies considerably according to the predilections of the worker, or writer, and variations within reason make no essential difference, save in the velocity of development. One may, of course, adopt the formula suggested by the plate maker, and it is always assumed, and sometimes claimed, that these are the best suited to the plates. But as someone once said: "A maker's formula generally shows the maximum amount of alkali and the minimum amount of restrainer, or, in other words, is the most trying developer that it is advisable to employ, or that the maker will guarantee his plate to bear."

The more alkali used the more rapid the development, and the shorter the total time of development. Increase of alkali cannot bring out more detail than the exposure has put into the plate. The only advantage in the larger amounts of alkali is that they develop out the fainter details in the shadows more quickly, so that one may stop development before the highest lights have become too dense to be properly rendered in a print.

W. F. A. Ermen has recently shown ("Phot. Journ., 1922, 62, 123) that, except in the case of hydroquinone, increase of carbonate of soda above N-5, that is about 1 per cent of the anhydrous salt, does not affect either the time of appearance or the density. As the time of appearance of the image is a practical measurement of the velocity and duration of development, it is obvious that if we use more than the above quantity we are merely wasting it and probably causing a greater tendency to fog.

The caustic alkalis, the hydroxides of potassium and sodium, are not so much used, except with some of the newer developers, mainly because they are supposed to cause frilling, cause more fog, and attack the fingers. As a matter of fact they can be used with excellent results, provided they are used properly. Their action with the developing agents is to form salts, the so-called phenolates, and this is well shown in the case of pyrogallol. The formula for this is $C_6H_3.OH.OH.OH.$, and it is possible to replace the H (hydrogen) of the three OH molecules with either potassium or sodium. Then we have:—

$C_6H_3.OH.OH.ONa$, the monophenolate,
$C_6H_3.OH.ONa.ONa$, the diphenolate,
$C_6H_3.ONa.ONa.ONa$, the triphenolate.

The last of these compounds, the triphenolate, is so energetic that it will reduce unexposed silver bromide at once; that is, it fogs the plate all over at once. The diphenolate is not quite so energetic and begins to reduce the image, but in about 2 minutes it also fogs the plate. The monophenolate gives no more fog than the carbonate, yet develops more quickly and actually converts the pyro developer into one that is more like metol than anything else.

It is easy to calculate how much of either of the caustic alkalis is required to form the monophenolate. Taking the molecular weight of pyrogallol, so often called pyrogallic acid, though it is not an acid, as 126, we only want to add one molecule of soda (NaOH = 40) or potash (KOH = 56) to the above quantity, according to the following equation:—

$$C_6H_3.OH.OH.OH + NaOH = C_6H_3.OH.OH.ONa + H_2O$$

Putting the above facts into a formula we arrive at the following:—

A. Pyrogallol	... ...	25 gms.	192 grs.
Sodium sulphite, dry	...	82 gms.	630 grs.
Water	... ...	1000 c.c.s	16 ozs.
B. Caustic potash	...	11.5 gms.	88 grs.
or caustic soda	... ...	8.5 gms.	65 grs.
Water	... ...	1000 c.c.s	16 ozs.

For use mix 1 part of A, 1 part of B and 1 part water. This gives normal density in from 2½ to 3 minutes, and a good black image with practically no trace of fog. This was suggested by E. Valenta ("Phot. Korr.," 1902, *83*, 703), and worked out on the above argument.

Some may consider that, as practical workers, there is very little interest in such facts as these, and that the equations are put in to look learned. But suppose we apply them to a particular case, and for this purpose take the article of Mr. J. J. Proskauer ("American Photography," 1922, 242). In the first place, I should personally find fault with the formula, because it leaves me in doubt whether the total bulk of the solutions is to be 72, 32 and 12 respectively, or whether the salts have to be added to these quantities of water, when the volume of each solution would be an unknown quantity, on which exact arguments cannot be based. Mr. Proskauer has probably given the formula as he received it. It is:—

A. Distilled water	... ...	72 ozs.
Sodium sulphite (E.K. tested)	...	6 ozs.
Hydroquinone (E.K. tested)	... ...	3 ozs.
Potassium ferrocyanide	... ...	16 ozs.
B. Distilled water	... ...	32 ozs.
Sodium sulphite	... ...	3 ozs.
Potassium ferrocyanide	... ...	8 ozs.
C. Distilled water	... ...	12 ozs.
Sodium hydroxide	... ...	6 ozs.

To use, take four parts A, two parts B and one part C.

As the caustic alkalis form the phenolates, and the formula of hydroquinone is $C_6H_4OH.OH.$, it is clear that caustic soda may form either the monophenolate or diphenolate, according to the quantity used. Assume the molecular weight of hydroquinone to be 110, thus:—

$$C_6H_4OH.OH.$$
$$72+4+17+17=110$$

Then the monophenolate is formed with 40, the molecular weight of the soda, and the diphenolate with 80.

Now to apply these facts to the formula. Assuming the total bulk of A and C to be 72 and 12 respectively (B does not interest us at all in this calculation), then it is obvious that as they have to be mixed in the ratio of 4:1 there will be 73 grains of hydroquinone, and this must require 53 of caustic soda to form the di-salt. But there were actually used 219 grains. That is 3½ times too much, or an excess of 166 grains in the 5 ounces of mixture, or taking into consideration now the B solution, there were 23.7 grains of caustic extra per ounce, which can do no good except blacken the plate.

If the quantity of soda in this formula be reduced one ought to have an equally active developer, with far less tendency to fog. Incidentally, let it be remarked that the use of potassium ferrocyanide in conjunction with a caustic alkali and hydroquinone was suggested by G. Balagny in 1891 ("Phot. Archiv.," 1891, 10) and A. Lainer ("Phot. Korr.," 1891, *28*, 6), and the latter's formula was for many years a favourite in Europe. The "Les-Lite" formula is merely a botched-up Lainer formula.

Should one want to use one or other of the salts, the following brief table shows the equivalent weights that should be used:—

NaOH	KOH	Na_2CO_3	$Na_2CO_3.H_2O$	$Na_2CO_3.10H_2O$	K_2CO_3
80	112	106	124	286	138
1	1.400	1.325	1.550	3.575	1.725
0.714	1.	0.946	1.110	2.553	1.232
0.755	1.033	1	1.170	2.698	1.302
0.323	0.452	0.858	1	2.307	1.113
0.280	0.392	0.371	0.433	1	0.483
0.580	0.812	0.768	0.899	2.072	1

To use this table it is only necessary to multiply the weight of a given alkali by the figure to that which it is desired to use; thus 5 of anhydrous soda are obviously equal to 1.170×5 of the monohydrate.

There is one action of the alkalis with developing agents, which are combined with acid radicles in order to increase their solubility in water, that should not be overlooked, and that is that the free base is precipitated on the addition of small quantities of the alkali. This is particularly noticeable with paramidophenol hydrochloride, $C_6H_4.OH.NH_2.HCl$; the action of the first addition of an alkali is to combine with the hydrochloric acid, setting free the base, which is not very soluble in water, and only on the addition of further alkali does it go into solution. The developing agents which show this property more or less are adurol (brom or chlor-hydroquinone), diamidoresorcin hydrochlorate, metol, ortol, paraphenylendiamine hydrochlorate and triamidophenol hydrochlorate; though with most of these, unless a fairly strong solution be used, the precipitate passes unnoticed. Naturally one has in these cases the chloride or sulphate of the alkali formed, and the former acts as a restrainer in developing.

Besides the above alkalis there are a few other agents that have been suggested, but which have not come into general use. Sodium tribasic phosphate, $Na_3PO_4.12H_2O$, was suggested by Lumière ("Jahrbuch," 1896, *10*, 190) on the ground that it gave greater density without attacking the gelatine or causing fog. However, this hydrolyses, on solution in water, into the normal or di-sodium phosphate Na_2HPO_4 and caustic soda NaOH:—

$$Na_3PO_4.12H_2O + H_2O = Na_2HPO_4.12H_2O + NaOH$$
$$380 \qquad\qquad 358 \qquad\qquad 40$$

It is therefore obvious that we only have to mix the normal phosphate and caustic in the weights given under the equation to form the same thing.

Acetone, $CH_3.CO.CH_3$, a characteristically smelling colourless liquid, produced by the dry distillation of acetates, was also recommended by Lumière and Seyewetz for use with those reducing agents capable of forming the phenolates. Its first action is to combine with the sulphite of the developing solution and form acetone sulphite, with the setting free of the sodium which combines to form the phenolates, as in the case of hydroquinone thus:—

$$2CH_3.CO.CH_3+2Na_2SO_3+C_6H_4.OH.OH.=$$
$$2(CH_3.CO.CH_2.NaHSO_3)+C_6H_4.ONa.ONa$$

This has not come into general use, and its only virtue would seem to be that it costs a little more; it works fairly free from fog, does not stain much, and does not soften the gelatine.

The only other compound we need consider is formaldehyde, again suggested by Lumière and Seyewetz ("Jahrbuch," 1898, *12*, 419), its action being comparable to that of acetone. The only developer that may be considered as having come into any use at all with this is the following:—

Hydroquinone	16 gms.	123 grs.
Sodium sulphite, dry ...	80 gms.	614 grs.
Formaldehyde	20 c.c.s	154 minims
Water	1000 c.c.s	16 ozs.

This is an extremely useful developer for making negatives of black and white line drawings and diagrams, as it gives, on photo-mechanical plates, extreme contrasts with clean whites.

The lithium compounds and a few other isolated agents have been suggested, but in the first case the price and insolubility of the lithium salts are against their general adoption, and in the other cases the substances would seem to have been suggested for the sake of spending more money or as merely something for someone to write about.

E. J. Wall.

REAL CAUSES OF BLISTERS.

In the current issue of "Studio Light," the monthly magazine for professional photographers issued only in the United States by the Eastman Kodak Co., are the following notes on the causes and preventives of blisters in prints:—

Blisters on prints are seldom due to any fault in manufacture of papers, but they may be produced on any gelatine paper by improper manipulation. The best way to prevent blisters is to understand their causes—the remedies then become obvious.

Blisters may form on prints during developing, fixing, washing or toning, or partly during either operation. Their formation during development is a rare occurrence. The same is true of fixing, unless the print is transferred direct from a strongly alkaline developer to a strongly acid short stop bath or fixing solution, in which case small bubbles of gas are formed within the gelatine film because of the action of the acid on the alkaline carbonate. The formation of gas in the gelatine is over the entire surface of the print. If for any reason the gelatine film has become softened, a small gas balloon is formed under each weak spot where gas is being liberated, resulting in blisters or so-called air bells. If the developer is not too alkaline or the acid short stop or fixing bath is not too acid, and prints are rinsed after developing, such blisters are not formed.

Air bells or blisters are liable to occur if the water used for washing contains an excess of dissolved air. Water under high pressure is usually the cause of the trouble. The water contains a great amount of dissolved air and the gelatine emulsion is saturated with water. If the temperature of the water is slightly raised, this air is expelled with the result that it may raise the gelatine and form an air bell. If the gelatine has been properly hardened the air bells are not so likely to form. If this trouble is a persistent one, the remedy would be an open tank into which the water could be drawn from the tap. This relieves the pressure and allows the air to escape.

All blisters, however, are not gas or air blisters. They are often filled with liquid, in which case they are caused by the phenomenon of osmosis.

If a solution of a salt such as hypo is inclosed within the gelatine film of a print and the print is immersed in water, there is a tendency for the water to penetrate the film at a greater rate than the hypo solution diffuses out. An internal pressure is thus created within the gelatine (and especially at the point of contact of the gelatine film and the paper support) which is known as the osmotic pressure of the hypo.

If by any means, therefore, the adhesion of the film and paper in any particular spot has become weakened, or if by swelling or softening or for any other reason the gelatine has become less porous in one spot than in another, the water will penetrate the gelatine film faster at that spot than the hypo diffuses out, with the result that a blister will form.

This osmotic pressure is often great enough to break the gelatine film. If the gelatine has been properly hardened and the print carefully handled, the gelatine should be uniformly porous and no such trouble experienced.

Most blisters are formed during washing after fixing, and their production is assisted by the presence of cracks, creases, or folds in the paper, since wherever these occur the gelatine film is likely to be broken away from the paper support.

Likewise, any factor in manipulation which tends to soften the gelatine locally tends to produce blisters. A powerful spray of water will soften the gelatine in the spot where it strikes the print, and touching the print with warm fingers will soften the print at the point of contact.

Washing at high temperatures should be avoided as much as possible, and in all cases the temperature of the various solutions should be maintained as nearly the same as possible. A frequent cause of blisters is the transference of prints from a warm fixing bath to cold water, and vice versa. In cold weather keep a fixing bath where it will be as cold as the water used for washing.

Apart from the effect of temperature, the use of alkaline wash water or an alkaline fixing bath, caused by carrying developer into the fixing bath with the prints, will tend to soften the gelatine and produce a condition favourable to blisters. It is important then to maintain the acidity of the fixing bath, or use a fresh bath at all times.

Blisters formed during after-treatment are usually caused by toning, and may be due to insufficient hardening, the use of one of the acid bleaching baths, an excessively strong sulphiding bath or too hot a hypo-alum bath, together with one or all of the above causes. If a print is not thoroughly hardened and is placed in a very hot hypo-alum toning bath, it will soften before the alum can begin its hardening action.

If, during final washing, it is seen that blisters have formed, the paper underneath may be pricked and the water squeezed out, or the print may be immersed in equal parts of water and alcohol, followed by a bath of alcohol alone. It is better, however, to prevent toning blisters by drying prints before toning, or better still, by treating with a 3 per cent. solution of formaline after washing and before toning, with or without drying, if there is any reason to believe prints may not be sufficiently hardened to withstand toning.

Assistants' Notes.

Notes by and for assistants will be considered for this column. Payment for accepted contributions is made on the first of the month following publication.

Small Workroom Economies.

In every photographic workroom there are ways—too many to count—in which small savings can be made in time or material.

In some cases, of course, a supposed economy may be only a matter of "penny wise and pound foolish." One man I knew served out some cheap draper's wadding to his assistant instead of the pure cotton wool generally employed for swabbing off negatives. The result was a batch of negatives so scratched that the extra work involved cost, in assistants' time alone, enough to pay for several years' supply of cotton wool.

As a matter of fact, a piece of medicated gauze, well washed and kept in a pot of water, has been found as effective as the best cotton wool without leaving any fluff on a corner of the plate. One piece costing a few pence will last many months in constant use, and so represents a real saving.

For local reduction and the like a little cotton wool is essential. Instead of leaving the roll about to get dusty, it is best to keep it in a box, of which the lid is towards one as it stands on the

shelf. The lower portion of the lid is removed entirely. Thus it is easy to pull out a small bit instantly as required while keeping the bulk clean.

Speaking of reduction, I have seen many dark-rooms where hypo and ferricyanide are just dissolved whenever required for use. This is just one of those innumerable things that are said to "only take a minute." This is a wasteful method, because not only is far too much of the chemical usually taken for the job in hand, but the newly-dissolved hypo is cold, so that the reducer is almost inert, and still more of the ferricyanide is added to overcome the tardy action.

As to the time taken, it is a very interesting experiment actually to take a record of the time occupied in making up these scratch solutions and then to reckon the actual cost of each of these operations in terms of the assistants' wages. Taking, for example, a Winchester of hypo saturated solution and a pint of potass ferricyanide of similar strength, it is fairly safe to say that the time taken to make them up is scarcely more than that required for one of the ordinary doses, provided one has hot water and reasonable facilities for making up such solutions.

In one studio I noticed a gas boiling ring used for heating the mounting-irons. It did not seem so obvious to the proprietor as it did to everyone else that the cost of the gas wasted in a quarter was more than that of a special small burner several times over. In another place I was struck by gas burners being kept alight all day. Although it was a busy shop and kettles of hot water were in fairly frequent demand, as well as batches of dry-mounting, it appeared that there were equally frequent, and sometimes long, intervals when nothing of the kind was wanted.

It was some little time before the reason for this waste came to light. It appeared that the assistant in charge had expended some small out-of-pockets among which was a dozen matches. On applying to the firm's cashier, he was referred to the secretary, a person of rather forbidding manner, who hum'd and ha'd rather unnecessarily over the trumpery expenditure. As the assistant in question disliked such painful interviews, he was faced with the alternatives of providing the firm with matches (amongst other small items) out of his own pocket, or of keeping a burner going all day. The fact of his being a non-smoker decided his taking the latter course.

The supply of spotting brushes seems to be a sore point with some people. It does not seem to be realised that the constant friction of the bristles upon paper, etc., wears them away, so that a brush cannot keep its point for ever.

In fact, the best of brushes has a limit to the work it will do before the point has gone. Now, there are two factors to consider. A brush that has not a good point makes spotting harder and far slower in the doing so that the time lost is soon worth more than a new brush. Then it should be known that a second-rate brush after a week's use is hardly better than a worn-out good one. In spotting brushes a few pence more for the best possible save, in the long run, many hours of niggling work.—D. C.

Photo-Mechanical Notes.

Chromate-Sensitised Resin.

A process which has the appearance of being a new departure in bichromate printing is the subject of a patent specification, No. 183,817, applied for by E. Doelker, of 48, Militär Strasse, Zürich, under the International Convention, but not yet accepted.

A layer of natural or artificial resin is sensitised with a chromate, and is exposed under a negative until the portions exposed are rendered insoluble in a developer comprising (1) an alkali or a substance having an alkaline reaction, or (2) alcohol or other organic solvent, with or without the addition of alkaline substances. The light-sensitiveness of the layer may be increased by adding (1) carbon disulphide, either pure or containing sulphur, or (2) albumen decomposition products. Numerous examples of resins, sensitisers and developers are given.

In one example of the process, 50 to 200 gms. of a non-sticky artificial resin, for example a condensation product of phenol and formaldehyde, are dissolved in 1,000 cc. of alcohol coloured with Schweinfurt green. 100 to 250 cc. of this solution are agitated for 1 to 5 minutes with 2 to 10 gms. of ammonium bichromate and filtered through cotton-wool. A polished zinc plate is roughened with a solution containing nitric acid and alum, rinsed, dried and warmed. The resin solution is then applied to the plate, exposure under a line or screen negative is made in sunlight for three to five minutes, and development effected with a 1 to 1.5 per cent. solution of caustic potash. The plate is rinsed, dried and warmed, and the resulting reproduction etched in fairly strong acid.

Alternatively, an exposure three or four times as long is given, and development effected with a mixture of equal parts of alcohol and glycerine. In another example an alcoholic solution of shellac is similarly employed. The sensitiveness of the resin layer may be increased by adding to it (1) 15 per cent. of carbon disulphide, or (2) 10 per cent. of a solution of albumen obtained by boiling 1 part of maize or wheat with 10 parts of alcohol under a reflux condenser for several hours. After development the backing material may be etched, or the developed layer may be used for direct printing. The process is said to be suitable for all photographic reproduction on non-absorbent backings in monochrome and polychrome printing, and for lithography.

Collodion and Silver Nitrate Consumption.

An operator who compounds his own collodion has many advantages over one who uses a commercial collodion, for, knowing the ingredients and their quantities he is able to calculate the amount of silver nitrate abstracted, and also the amount of by-products left in the bath by the chemical reaction set up by the formation of the sensitive silver haloid.

How this can be done may be explained as follows: Take a winchester of collodion "iodized" with :—

Zinc iodide	320 grs.
Lithium chloride	60 ,,

Here we have 380 grs. of haloid requiring for conversion to silver haloids 580.8 grs., producing 673.92 silver haloids and 286.88 of by-products, i.e., nitrates of zinc and lithium. Each ounce of collodion sensitised as above will contain 4.5 grs. of halogens and consume 7.26 grs. of silver nitrate, leaving in the bath 3.586 grs. of by-products. At the end of the day's negative-making, if a note is made of the quantity of collodion used, the amount of silver nitrate, taken out of the bath may be calculated and replaced. Assuming that 9 ozs. of collodion has been used, then the addition of 90 grs. of silver nitrate will compensate for the abstraction of silver nitrate, by the formation of the sensitive silver haloid and for that which has clung to the film, i.e., if the plates have been well drained after taken from the bath, if not, then 100 grs. will be needed

When such a course of procedure is followed and kept up, the silver bath will keep in good condition and give better and more uniform negatives than when the bath is worked till it gives out from sheer exhaustion.

In addition to keeping the silver nitrate up to its normal strength, the operator is able to note the gradual accumulation of the by-products, which, when in a small quantity, are no doubt of great use, but there must be a limit to the usefulness of these alien nitrates, and if these accumulations have been noted the limit of their usefulness can also be determined.

With line negatives the limit of these alien nitrates is much higher than when screen negatives are wanted, the solidity of the fine dots being much influenced if these nitrates are in excess.

Operators using other haloids than those given above may be interested to know how the above figures are obtained. This is just a simple equation. Divide the molecular weight of silver nitrate by that of the halogen. Thus taking ammonium iodide as the halogen,

Silver nitrate	$AgNO_3$	170	
Ammonium iodide	NH_4I	145	= 1.172

showing that each grain of ammonium iodide requires 1.172 grs. of silver nitrate for full conversion to silver iodide. Bromides and chlorides may be calculated in the same way.

When the base is a bivalent, then two molecules of silver nitrate are required, producing two molecules of silver haloid, and one molecule of nitrate thus :—

$$\frac{2AgNO_3}{ZnI_2} \quad \frac{340}{319} = 1.066 \qquad \frac{2AgBr}{ZnI_2} \quad 1.473 \text{ and } \frac{Zn(NO_3)_2}{ZnI_2} = .592$$

W. T. Wilkinson.

FORTHCOMING EXHIBITIONS.

October 18 to 21.—Rotherham Photographic Society, Hon. Secretary, S. G. Liversidge, Orissa, Gerard Road, Rotherham.

October 18 to 28.—Portsmouth Camera Club. Particulars from the Hon. Secretary, C. C. Davies, 25, Stubbington Avenue, North End, Portsmouth.

November 4 to 11.—Bournemouth Camera Club. Particulars from the Hon. Secretary, 88, Old Christchurch Road, Bournemouth.

December 9 to 31.—Rochdale Amateur Photographic Society. Particulars from the Hon. Secretary, W. Lord, 10, Derwent Street, Rochdale.

1923.

February 5 to March 3.—Northern Photographic Exhibition, City Art Gallery, Manchester. Latest date for entries, January 12. Particulars from the Hon. Exhibition Secretary, Walter Johnson, 30, Hartington Road, Chorlton-cum-Hardy, Manchester.

March 2 to 31.—Pittsburgh Salon of Photography. Latest date, February 5. Secretary, Charles K. Archer, 1,412, Carnegie Building, Pittsburgh, Pa., U.S.A.

March 13 to 16.—Exeter and West of England Photographic Exhibition. Particulars from the Hon. Secretary, Frederic G. Tutton, 9, Union Road, Pennsylvania, Exeter.

March 16 to 24.—Photographic Fair, Holland Park Hall. Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications September 25 to 30.

DAYLIGHT DEVELOPMENT.—No. 26,225. Manufacture of negatives from roll-films in daylight. H. J. J. van den Boogaart.

SHUTTER DEVICE.—No. 25,865. Electro-mechanical starting and stopping device for photographic shutters, etc. C. P. Lingwood and C. G. Lowen.

PHOTO-MICROGRAPHY.—No. 25,927. Apparatus for taking low-power photo-micrographs. H. G. Butterfield.

APPARATUS.—No. 25,959.—Apparatus for discovery and correction of astigmatism. R. V. Greene.

TELEGRAPHIC TRANSMISSION OF PHOTOGRAPHS.—No. 26,085. Method of telegraphing photographs. T. T. Baker.

CINEMATOGRAPHY.—No. 26,204. Method of producing a natural effect in projected pictures. T. H. Marten.

CINEMATOGRAPHY.—No. 26,034. Cinematograph screen. A. J. Vickery.

STEREOSCOPIC CINEMATOGRAPHY.—No. 25,860. Stereoscopic motion pictures. L. Hammond.

Applications, October 2 to 7 :—

DAYLIGHT PHOTOGRAPHY.—No. 26,816. Daylight photography. E. P. M. Fortun.

DEVELOPERS.—No. 27,200. Photographic developers. E. C. R. Marks (Daylight Film Corporation).

LENSES.—No. 27,159. Photographic lenses. Kapella, Ltd., and H. W. Lee.

LENSES.—Nos. 26,553, 26,952, 27,052. Photographic lenses. Ernemann-Werke Akt.-Ges.

LENSES.—No. 27,188. Lenses. F. J. Russell.

RELIEF PHOTOGRAPHS.—No. 26,793. Production of relief or embossing effect on photographic prints, etc. E. Bardili and C. H. Kruger.

CINEMATOGRAPHY.—No. 26,795. Cinema photography and projection. J. Cooper and Stereo Kinema Syndicate, Ltd.

COLOUR CINEMATOGRAPHY.—No. 27,174. Colour cinematography. A. H. Bannister.

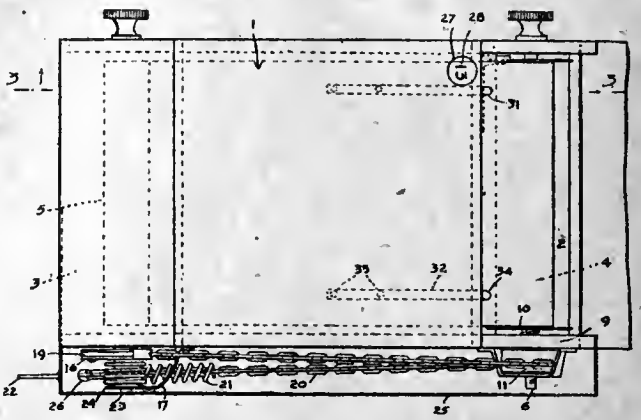
COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

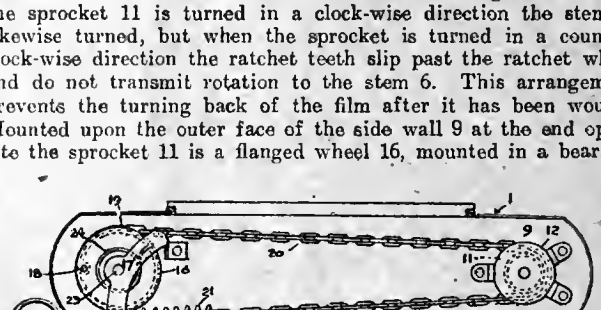
The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

ROLL-FILM CAMERA MECHANISM.—No. 165,756 (July 1, 1920). In the invention, the unwinding of the film to present a picture section in proper position for exposure is effected by pulling a chain, so that when the section is in proper position it is frictionally held. Further pulling of the chain can only be effected by overcoming the resistance whereby the operator is warned that the film is in the proper position.

The illustrations show a folding pocket-type of camera. At the ends are provided compartments 2 and 3 for a winding roll 4 and a film roll 5. These rolls are inserted in the usual way.



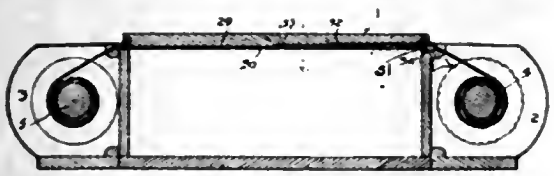
The film from the roll 5 is connected in the ordinary manner with the winding roll 4. In one end of the compartment 2 for the winding roll there is provided a winding stem 6 having a head 7, which is inserted into the transverse notch 8 in the end of the roll. This stem is rotatably mounted in the side wall 9 of the camera, and is longitudinally adjusted. It is normally extended by a helical expansion spring 10. The stem 6 is extended through the centre of a sprocket wheel 11, which is mounted in a bearing 12 fixed upon the outer face of the wall 9. Ratchet teeth and the ratchet wheel are so arranged that when the sprocket 11 is turned in a clock-wise direction the stem is likewise turned, but when the sprocket is turned in a counter-clock-wise direction the ratchet teeth slip past the ratchet wheel and do not transmit rotation to the stem 6. This arrangement prevents the turning back of the film after it has been wound. Mounted upon the outer face of the side wall 9 at the end opposite the sprocket 11 is a flanged wheel 16, mounted in a bearing.



Fixed by a removable pin or screw 18 to the wheel 16 is an elastic band 19, which is wrapped around the wheel and extended in the direction of the sprocket 11. Connected with the end of the band is a sprocket chain 20, which extends over the top of the wheel 16, and is wound round the sprocket wheel 11 and returned beneath the wheel 16. The sprocket chain 20 is extended through a helical spring guide 21, fixed to the bracket and bearing 17, and upon the free end of the chain a ring is fixed. The axle 23 for the wheel 16 has a helical spring 24 mounted thereon, and this is fixed to the bearing 17 and to the wheel 16 so as to return the wheel to its normal position after the chain has been pulled. In rotating the wheel 16, the elastic band is unwound. When it is desired to unwind a film roll so as to present a picture section of the film in position for exposure, the ring on the free end of the chain is grasped and the chain pulled to its full extent outwardly. This causes the sprocket wheel to be rotated in a clock-wise direction, and by reason of the ratchet arrangement between

the stem and sprocket wheel, the winding roll 4 is also rotated and the film wound thereon.

The length of the chain is such, and the mechanism so constructed that when the first film section is brought into position for exposure one pull only is required to move the next section into position. As a warning to the operator that the picture



section is in proper position, the projections 31 engage with the openings 31 and further movement of the chain is met with resistance.—Kotaro Sayo, 1820, Post Street, San Francisco, California.

PHOTO-STEREO SYNTHESIS.—No. 158,552 (January 21, 1920).—The invention, which was described in detail in the "B.J.," 1921, February 25, p. 110, consists in preparing a number of positive transparencies representing successive planes of the subject, and mounted one behind the other. The intervals between the transparencies are proportional to the separation of the planes in the original subject, and to the scale of reproduction. The transparencies are then mounted in such a way that they are illuminated by strong transmitted light, from a chosen standpoint, and when viewed produce the sensation of solidity. The camera used in connection with this invention is capable of being moved from or towards the object, along the principal axis of its objective for each exposure, so that the object is photographed in successive parallel planes. The extent of movement of the camera is equal to the distance separating the successive planes of the object. The objective and the sensitive plate are also displaced continuously during each exposure in the plane of the objective and the image plane respectively. These displacements are kept in constant ratio to each other.—Louis Lumière, 262, Cours Gambetta, Lyons, France.

SWING-FRONT LENS MOUNTS. No. 184,908 (May 30, 1921).—The invention consists of a spherically-jointed lens mount for enabling the optical axis of the lens to be swung in any direction within angular limits. A funnel-shaped ring takes the lens and shutter, and this is attached by means of a slightly wider ring to the camera front. The two rings are kept in contact, and are able to move, one over the other, in all directions. A lens with a shutter body is indicated diagrammatically at 10, fig. 1, carried by the wall 11, which closes in the front or large end of a hollow spherical shell 12. The outer surface of the shell 12 works against the inner surface of a stationary hollow spherical chamber 13 carried by the panel 14. The common centre of these two chambers is at 15, within the lens 10, at the rear principal

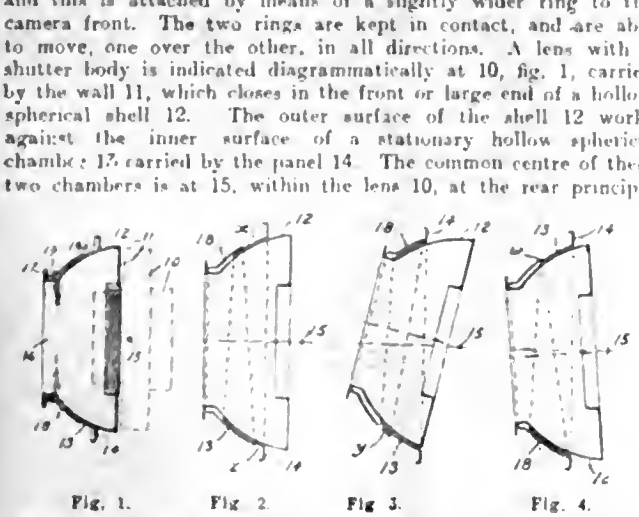


Fig. 1. Fig. 2. Fig. 3. Fig. 4.

point of the optical system, and outside the plane of the camera front. The moveable shell 12 is open at its smaller end, where it is formed into a cylindrical portion 16 carrying a ring 17. This is detachable, and the drawing shows it as screwed on. A ring 18 bears against the outer surface of the chamber 13, and is retained in contact by means of a spring 19 under compression between the rings 17 and 18. It will be seen that in this way the two shells 12 and 13 are frictionally held in moveable contact the one with the other, and that if 13 is held stationary on the lens panel or camera front the axis of the lens 10 can be swung in any direction within angular limits about the rear principal point 15 of the optical system. Figures 2, 3 and 4 represent various positions obtainable, the panel 14 being stationary and fixed to the camera front.—Claude Horace Clarke, Dorincourt, Maresbrook, Essex.

PHOTOGRAPHIC REPRODUCTION OF TYPE CHARACTERS.—No. 182,887 (April 7, 1921). The invention provides a rectangular frame in which is carried a number of characters arranged behind a source of light. Shutters are fitted in front of each character, and can be operated by hand or pneumatic power.

The images of the characters are projected by means of suitably placed lenses and prisms to a common focus on a movable sensitive band, which is conveniently placed in a suitable compartment, and mounted on reels. The shutters may be operated by hand from a keyboard, each key of which represents a character or space. By depressing a key the corresponding shutter is operated, and the band moved transversely, after each depression, in a similar manner to that employed on a typewriter. It is therefore possible to obtain a line of exposures, representing the characters, on the sensitive band.

A perforated strip may be used to operate the shutter mechanism if required. This strip passes over a tracker bar, in which are a number of apertures, so connected to the shutter mechanism that when a perforation passes over an aperture in the bar the exposure is made.—Walter Broadbent, 54, Rosebank Avenue, South Harrow, Middlesex.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

VELOPHOT.—No. 427,299. Photographic apparatus included in Class 8. "Velophot" Erzeugung und Vertrieb Photographischer Neuheiten Gesellschaft mit Beschrankter Haftung, 4, Concordiaplatz, Vienna I, Austria, manufacturers. June 22, 1922.

REGISTRATIONS RENEWED.

ORTHINAL. No. 307,395. Ilford, Ltd. Registered in 1908 in Class 1.

TRADE MARKS REMOVED FROM REGISTER.

In the official language of the "Trade Marks Journal" the following trade marks have been "removed from the register through non-payment of renewal fees." Such non-payment is of course the method adopted by a firm having no further occasion for the use of a mark.

BROMOIL.—No. 303,928. John J. Griffin & Sons, Ltd. Registered in 1908 in Class 39.

ESSYSOLIS.—No. 304,684. Houghtons, Ltd. Registered in 1908 in Class 1.

ESSYSA.—No. 304,685. Houghtons, Ltd. Registered in 1908 in Class 8.

ESSYSA.—No. 304,[illegible]. Houghtons, Ltd. Registered in 1908 in Class 39.

New Materials.

BUTCHER'S MOUNTING STAMPS.—As an easy method of mounting photographs, the adhesive mounting stamps, supplied by Messrs. W. Butcher & Sons, Ltd., Camera House, Farringdon Avenue, London, E.C.4, are a great advance, as regards cleanliness and convenience, upon the usual methods of mounting with paste. These stamps consist of pieces of fairly stout paper measuring only ¾ in. by ½ in., gummed on each side. To attach a photograph to a mount, four stamps are taken, and, after moistening, are stuck to the corners of the print. When these are dry the exposed side of each stamp is then moistened and the print placed in position on the mount. Each corner should be firmly pressed down, and a sheet of plate-glass placed on top of the print. Photographs may be mounted by this means on very thin paper or in albums. The mounting stamps are now issued in the form of a pad, with perforated sheets interleaved with grease-proof paper. The perforations allow the stamps to be easily detached, while the pad is a clean and convenient method of storage. The price per pad of 200 stamps is 1s.

New Books.

Practical Color Photography. By E. J. Wall. Boston: American Photographic Publishing Co.

PROBABLY among the various text-books dealing with photographic subjects one on colour photography is the most sought after, since it interests not only those who are practical workers of the Autochrome and Paget processes, but also those who take a general interest in the subject and have a taste for trying their hand at the many processes of making three-colour prints and transparencies by one or other of the assemblage methods. A comprehensive text-book of the subject on practical lines is, therefore, one which should be available. Such a book, however, which is close upon the heels of what has been accomplished in colour photography, has not, unfortunately, been available for some years. Mr. Wall has filled the breach in the excellent way which was only to be expected from his wide acquaintance with the subject from both the practical and historical standpoints. The latter aspect of the subject, however, receives little emphasis in the present work, which concerns itself predominantly with the technique of the various processes of colour photography, makes brief mention of their origins, and gives sufficient exposition of the principles of colour and colour mixtures for a ready understanding of the theory of the processes,

Many workers at the present time will purchase a book on this subject for its information on the screen-plate (Autochrome and Paget) processes, and the production of colour transparencies upon this principle thus appropriately forms the longest chapter in the book. The mechanism of colour reproduction by a mosaic filter-plate is very clearly shown by diagrams; and this part of the work contains full formulæ for compensating light-filters, developers, correcting screens for use in the viewing of transparencies by artificial light, in addition to sections on the copying of screen-plate transparencies, and on stereoscopic work with screen-plates. The chapter does not attempt to reproduce the working instructions issued for the use of the Autochrome and Paget plates, but usefully supplements these latter, and the only criticism which may be made in respect to it is that the author has not sufficiently emphasised the features of the Paget process, and has said practically nothing about its manipulation. A page or two might usefully be added on the making of the Paget positive transparency and its registration with the viewing screen.

The three-colour methods, additive and subtractive, are very comprehensively treated, and the student will obtain from the book a good working knowledge of current practice in the making of the set of three colour-sensation negatives and their use in the production of prints or transparencies by the assemblage method. The printing processes which are considered in detail are carbon, Pinatype, dye-toning, gum-bichromate, in addition to methods depending upon the production and staining of a gelatine relief. Mr. Wall has had a long first-hand experience in these methods and has made good use of his material in putting the essential details of the processes in compact form. Three-colour lantern-slides is the subject of a special chapter in which is described the making of transparencies with dyed relief on celluloid film; and in this place also instructions are given for the making of a photochromoscope for the viewing of three-colour effects on the additive system. The later chapters deal with methods which could not be omitted from a treatise on colour photography, although they are of much smaller practical interest. These are the bleach-out process, the Lippmann or interference process, the interesting optical methods by diffraction and prismatic dispersion, and also the methods which figured largely in the early days of photography, when much was expected of the colours which silver chloride assumes when exposed to light of different colours. The book is made complete and up-to-date by chapters on two-colour processes, including the Kodachrome, and on the systems of simplified colour work which have been embodied in materials such as the tri-pack of Mr. Ives. The final chapter is a brief review of processes of colour cinematography. In short, the book is a practical manual for the student and experimental worker, to whom it can be recommended as a complete and trustworthy source of information.

PRACTICAL COLOR PHOTOGRAPHY.—By arrangement with the American publishers, Messrs. Henry Greenwood & Co., Ltd., are able to supply copies of the new book, "Practical Color Photography," by Mr. E. J. Wall. The book is supplied post free to any part of the world at the price of 13s. 3d.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, OCTOBER 23.

Birmingham Art Club. "Passe-Partout Framing." H. J. Shepherd.
Bradford P.S. "The Story of Old Bradford." H. J. M. Maltby.
City of London and Cripplegate Phot. Soc. "The Negative and the Picture." J. J. Butler.
Dewsbury Phot. Soc. "By Wood and Moorland up the Hebden Valley." S. Greenwood.
Halifax Scientific Soc. "An Evening in Lakeland." A. Keighley.
Kidderminster and District P.S. The Leicester Travelling Folio.
Southampton Camera Club. "Wonderlands of the Western World." J. Dudley Johnston.
Wallasey Amateur Phot. Soc. "Portraiture." E. Knowles.
Willesden P.S. "Colour and its Monochrome Rendering." J. A. Hall.

TUESDAY, OCTOBER 24.

Birmingham Phot. Soc. "The Tower of London." A. H. Blake.
Cambridge Phot. Club. "A Dive into Belgium." W. L. F. Wastell.
Exeter C.C. "The Manufacture of Ross Lenses." A. Dordan Pyke.
Hackney Phot. Soc. "Bromoil." S. Woodhouse.
Halifax Scientific Soc. Y.U.P. "Trophy Pictures (1922)."
Leeds Phot. Soc. "The Carbro Process and Carbon Printing." O. J. Wilkinson.
Maidstone and District P.S. "Modern Negative Making." M. Slater.
Manchester Amateur Phot. Soc. "Developments in Photographic Chemistry." T. Thorne Baker.
Portsmouth Camera Club. Cinematograph Entertainment.
South Glasgow Camera Club. "Summer Service with the S.G.C.C." R. M'Morrine.

WEDNESDAY, OCTOBER 25.

Borough Polytechnic Phot. Soc. "The Making of a Lantern Slide." A. H. Page.
Croydon C.C. "The Mounting and Finishing of Prints." N. Moody.
Partick Camera Club. Whist Drive.
Rochdale Phot. Soc. Tit-Bits of General Information. W. Bamford.
South Glasgow C.C. "Apparatus and Exposure." A. M. Kerr.
South Suburban and Catford P.S. "Desensitol." Messrs. Ilford, Ltd.
The Photomicrographic Society. "The Technique of Rock-section Preparation." Prof. W. T. Gordon.

THURSDAY, OCTOBER 26.

Cambridge Phot. Assoc. "The Art of Picture Making." Dan Dunlop.
Hammersmith Hampshire House Phot. Soc. "Some Pictures, Stories and Etymologies of Familiar Flowers." G. H. Rodman and G. Hawkings.
Kinning Park Co-op Soc. Camera Club. "Art in Relation to Photography." J. Huck.
Letchworth Camera Club. R.P.S. 1921 Competition Prints.
North Middlesex Phot. Soc. "The Charm of the Village Church." F. G. Emler.
Richmond C.C. "Life History of the Cuckoo." F. B. Payne.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held on Tuesday, October 17, Dr. G. H. Rodman in the chair. Squadron-Leader F. C. V. Laws, O.B.E., R.A.F., delivered an interesting lecture, illustrated by many lantern slides, upon the subject of "Progress in Aerial Photography."

Major Laws, in referring to the state of aerial photography, said that in 1914 it was difficult to locate unmounted troops at 3,000 ft., while at the present time such advances had been made that pigeons feeding upon the ground could be easily seen in photographs taken from a height of one and a half miles. Since 1918 thousands of square miles of territory had been covered for the purposes of mapping, but Major Laws did not make the claim that the aerial photograph would take the place of the ground survey map. The aerial photograph would rather help to speed up and assist in mapping, while for surveying forest land and difficult tracts of country the photograph would be of great help. Major Laws referred to the Fairchild survey in the United States, and related how on the occasion of an aerial survey being made for a railway company a large cemetery was found to be directly in the line of the proposed construction. It was only possible to prove such cases from the air, the ground survey being much more difficult and less decisive. For the correction of maps, aerial survey was of great assistance, and the lecturer showed a series of lantern slides illustrating the method of constructing a map from an aerial photograph. A photograph of Mons was shown, first as it was rendered by the camera; the important details were then outlined in waterproof ink and the photographic image bleached out. The resulting slide gave a perfect map appearance. The important difference between this and the Ordnance Survey map was

that the photograph showed the exact position of all the railway lines and sidings, while the survey map did not. Insurance companies were using aerial surveying to show the accessibility of property insured. The photograph gave an excellent idea of this work, and the time occupied in the actual survey was negligible as compared with a ground survey. Some excellent mosaics were shown. These comprised many separate prints, which were overlapped and joined in such a manner that the resulting air picture resembled one large view, probably covering many square miles. Some aerial slides by the Central Aero-Photo Co. and Aero-Films, Ltd., were shown, an oblique picture of Bath being much admired. Oxford, with its white stone buildings, also made an imposing view, while the aerial view of the Cup Final last year, by Aero-Films, Ltd., was as perfect as this class of work can be. Major Laws also considered that the aero photograph was of great value for advertising purposes, but that part of the business should be left to private concerns. The Services at the present time were taking great interest in aerial photographic survey, and much important work was being done. Major Laws said that since 1919 his duties had taken him over the greater part of Europe and the East, and he had realised how important was the work of aerial survey.

Explaining the types of camera used prior to the Armistice, Major Laws said that the pre-armistice camera was a very bulky object. Using as it did, 5 ins. x 4 ins. glass plates in magazines and taking lenses of long focal-length, it was an awkward piece of apparatus. The lack of perfect balance in the plate changing system was very unfortunate. The total weight of the plate camera and all its accessories, when using 18 x 24 cm. plates, was 260 lbs., while the plates and magazine with the changing gear weighed 190 lbs. alone. The mechanism was not by any means perfect, and the alternative exposing gear was not in such a high state of efficiency as it is to-day. Referring to the chance of breakdown in the camera, the lecturer said that an aeroplane cost £10 an hour to fly, and if the camera could not take the photographs required owing to some fault, it was going to be a costly matter. The 150-exposure film camera which was now being used weighed only 45 lbs., while it occupied the same space as the plate camera. The ideal aerial camera, as described by Major Laws, was light in weight, small, simple, yet automatic in action. Its centre of gravity should be constant, and lenses of any focal length could be used. The film or plate should be held stationary during exposure and in the exact focal plane. Major Laws also recommended that an efficient between-lens shutter should be used. The new camera with which the Services were now working followed closely upon the lines of the ideal, and many important improvements had been made. This camera would make a negative 7 inches square upon film, and during exposure the particulars of the altitude of the plane, angle of tilt, date and time are recorded upon the margin of the film and show upon development of the image. This camera had three controls, one electrical, which could be set to work automatically with a regular interval between each exposure; another, which was situated in the pilot's or observer's cockpit, and which had for its mechanical power a small propeller working in the slip-stream; and a third, which was hand-operated, for use should the others fail. Lenses up to 47-ins. focus could be used. This camera was of great use for filling in map-work, or for survey over country where ground work was difficult or impossible. Major Laws showed some slides of a multiple lens camera, in which five lenses were mounted in close proximity to each other, the central lens being used upon its optical axis.

The other lenses had reflecting-mirrors fitted at an angle of 45 deg. to each, and a series of pictures taken in four directions, and also the central view, were recorded upon the one plate. This camera was only in the experimental stage, and had not yet been into the air. Speaking of films for aerial photography, Major Laws said that the film camera was now taking spools measuring 50 ft. by 8½ in., and there was great difficulty in developing and washing such a large mass of film. A new type of developing drum was shown, which had the advantage that it was possible to develop and wash the large films used without touching them in any way by hand; thus preventing finger markings, which were so difficult to remove. Referring to the mounting of the camera in the aeroplane, Major Laws said that the new triple frame was very efficient. The vibrations of the plane were easily overcome by this new attachment, especially the difficult adverse vibrations which effect the sharpness of the photograph most. Some interesting slides were shown which proved the efficiency of this new form of mounting, and a method of recording the adverse vibrations of the plane was also shown. This consisted of flying an aeroplane at night over three powerful lights placed on the ground, with the shutter of the camera kept open and a plate exposed. With the old-type camera mounting a series of saw-shaped bands of light were formed on the plate, while with the triple-frame mounting a nearly straight line was produced. Another interesting series of slides comprised sections of high-speed cinema films showing the bursting of flash bombs, while an actual photograph of the ground taken by the light of one of these bombs showed a hut illuminated brilliantly at 2,000 feet distance. A series of excellent mounted photographs had just been returned from the International Aerial Exhibition at Brussels, and were on view; and one of St. Paul's, taken at 8,000 feet with a 20-in. focus lens, actually showed the pigeons feeding on the steps of the building. In conclusion, Major Laws referred to the value of aerial photographs of such subjects as were not visible in the ordinary way. He illustrated his remarks by showing some excellent slides of the Pyramids, which clearly showed the outline on the ground of buildings which had apparently occupied the position in ancient days. These details were not visible from the ground.

At the request of Dr. Rodman, a very hearty vote of thanks was accorded to Major Laws for his lecture.

CROYDON CAMERA CLUB.

The gentleman whose privilege it is to write the weekly report of this Club (whether he is "office boy," "potman," or what, I do not know) has this week, with more modesty than real occasion, thrown up his task, because the notice necessarily takes the form of a critique upon the house exhibition which has been open this week to the public. Where this angel has feared to tread I have been rushed in at short notice, and, with considerable pleasure, have undertaken what I should have been sorry to miss.

The exhibition is distinctly good, and in one respect at least, is rather unique, if there can be degrees of uniqueness; for it possesses a print of a kind rarely seen, and still more rarely one so good of its kind. This is E. A. Salt's "Portrait by Candlelight" (1). I have seen it before, or one like it, and am glad of another view of it, because it exhibits purely and absolutely the beauty which simple illumination brings about through gradation. The rapid passage of light to dark upon the pillow is real drama in light and shade; the halo round the candle-flame is a marvel; and the whispers of creeping light in the uttermost depths of the dark parts are a joy because they satisfy reason and logic, yet have all the poetry of mystery. And then the charm of the sitter!

Another poem is H. P. C. Harpur's "Sunlight" (17), an architectural interior of great truth and beauty; especially as regards the church window. The quality of this is very fine. The big, dark, near pile should have been shorn right away (for the window is interest enough) and the print been sent to the Salon or Royal. Another by Mr. Harpur is "Slopes of Ide Hill" (85), a charming landscape, wherein perhaps the sheep are a trifle assertive. His "Peace" (81) a quiet sea and setting sun, is in perfect keeping.

Bromoil cannot be said to be the favourite method at Croydon: but nevertheless some of the best work is pigmented. E. J. Wadham's "Butter Market in a Church Porch" (19), is cleverly treated. The church is nice in quality and the peasant crowd pictorially interesting. "A Passing Storm" (30) is a mountainous scene by J. T. Morgan, produced with the pliability we attribute to Bromoil; but it is a bromide. When we come to J. Keane's "On Reigate Heath" (43), we see what delicacy and yet what firm surfaces Bromoil may be capable of. Here is lovely quality, with just tones in the trees and horse and cart; splendid effect of daylight and a delightful composition. S. J. Taylor's "St. Paul's from London Bridge" (49), is another Bromoil of quality; but the barges in the foreground are sad anti-climax. The bottom half of this print wants eliminating. Mr. Taylor's other Bromoils are all charming, particularly "Sunshine" (61) and "Thaw" (62), a fine essay in strong work. What is shown of "Cologne Cathedral" (72) in J. Walker's bromide is first rate. The print is a decorative strip; but it has a sense of space in spite of its drastic trimming. His view of a foggy effect on what appears to be the Thames Embankment shows a real sun in the sky, and makes a beautiful picture, of the photographic kind, called "November" (79). Another successful sun in a mist is seen in "The Pool" (73), by H. C. Inskeep, whose "Pine Woods" (77) is fine also, but in a different direction. It is beautifully composed, and has very convincing tone values.

A chloro-bromide print of "Castle Mill, Dorking" (74), by N. Moody, possesses an unphotographic quality of tone that may or may not be due to the process. The sun on the white walls is luscious, and the whole thing is charming. I don't quite know what I mean by unphotographic quality; certainly I could not explain it; but in pointing out A. E. Isaac's "Stare Cove, Lulworth" (40), I should say that its quality was what we mean by photographic. This, of course, has nothing to do with the selection of subject or general design, which is admirable.

N. Moody's "St. Paul's from Bankside" (51), has the great merit of being an original view. It includes part of an immense arch, beyond which is the cathedral, opposed in sentiment, as well as in tone, by a great crane that stands before it. This is a most successful work in every respect; full of artistic feeling. Another excellent and original selection is J. M. Sellor's "Man's Handiwork" (80)—the stone-work around the western end of the St. James's Park lake. Mr. Sellors has seen and secured the palatial renaissance feeling of all this, and made a dignified subject. His other works show his sensitiveness to the beauty of line and contrast; and V. Jobling's collection of portraits of the young show where his tender spot is.

The muster is 87 examples, all interesting, including a collection of the coloured portraits produced by E. G. Handel-Lucas's process, which baffles everybody but himself. They are astounding results; none the worse for keeping close to the photographic image when it is worth keeping close to; but Mr. Lucas will have to be careful of his shadows where the photographic basis is disposed to be incorrigible.

S. W. Rose and N. Moody supply a little Paget Colour show, most ingeniously and effectually displayed.

No one would believe, from the hilarious reports which have made this club famous, that there was seriousness of purpose enough to produce a show of such high merit.

F. C. Tilney.

Forest Hill and Sydenham Photographic Society.—On October 11, Mr. Cutbush, a member, gave an interesting lecture on tanks and tank development, and showed various kinds of tanks, including one of his own design, which has all the advantages and none of the drawbacks of the previously existing ones. It is of the horizontal pattern, and can be used for one plate only if desired, or for any number up to twelve, only using the quantity of developer required for the plates to be developed, thus effecting great economy in use. Moreover, it is constructed so that it is impossible to put two plates in the same groove, a boon to users of panchromatic plates.

Glasgow and West of Scotland Society of Professional Photographers.—At the meeting held in the Regent Studio (Messrs. Brinkley & Son), Glasgow, on October 9, interesting and instructive demonstrations on spot lighting, Eastman film and diffusion discs were given by Messrs. Laurence, Webb and Scott, of Kodak, Ltd. The lecture and demonstrations were greatly appreciated by a large audience. During the evening the lecturers exposed and developed films, which were exhibited to the audience. Mr. J. R. Brinkley, the President of the Society, occupied the chair. Votes of thanks to the lecturers terminated the meeting.

Commercial & Legal Intelligence.

NEW COMPANIES.

Burroughs, Wellcome & Co. (South Africa), Ltd.—This private company was registered on October 5 with a capital of £20,000 in £1 shares. Objects: To acquire the business carried on by H. S. Wellcome at Cape Town as "Burroughs Wellcome & Co.," and to carry on the business of dealers, wholesale and retail chemists and druggists and druggists' sundriesmen, photographic dealers, etc. The first directors are: H. S. Wellcome, 6, Gloucester Gate, N.W.1; G. E. Pearson, Embassy Hotel, Bayswater Hill, W.; J. C. Smith, Holmwood, Cumberland Park, Acton, W.3 Qualification: One share. Remuneration: As fixed by the company. Secretary: G. L. Moore. Registered office: 67, Holborn Viaduct, E.C.

News and Notes.

The Service Co., Ltd. (London), inform us that they are removing the photographic section of their business, at the end of the present month, to new premises, at 273-274, High Holborn, London, W.C.1. The new premises are situated only a few doors west of the old address.

Barkay Reflectors.—These reflectors for the portrait studio, the advantages of which were the subject of an article in our pages some weeks ago, are now supplied by the actual manufacturers, Messrs. Robinson, King & Co., Grove Glass Works, Marshgate Lane, Stratford, London, E.15.

Heliolette Background Negatives.—The series of these film negatives, which formerly were supplied by Mr. J. A. T. Fraser, have now been taken over by Messrs. Jefferies & Co., Ltd., Pembroke House, High Road, Seven Kings, Essex, who supply them in a considerable variety of size and subject.

"Camera House Journal."—The October issue of Messrs. Butcher's publication contains particulars of goods for the winter trade. The "Dualito" electric enlarging lantern, in both horizontal and vertical models, and the "Club" optical lantern are striking items. Home cinematography is catered for in the various models of the "Empire" projector. A clearance of albums is also announced.

Aldis-Ensign Vertical Enlarger.—A distinctive folder, which explains the working of this new type of vertical enlarging lantern (recently noticed in our pages), has just been issued by Messrs. Houghtons, Ltd., 88-89, High Holborn, London, W.C.1. The folder demonstrates, in a striking manner, the advantages claimed for the enlarger; dealers are advised to obtain copies for distribution to their customers.

Photographic Societies Amalgamate.—The South Suburban Photographic Society and the Catford Camera Club have amalgamated. The fusion has been brought about not because of any sign of weakness—each having about seventy members and money in hand—but by a desire to form a particularly strong society in the S.E. district of London. For some years past the two societies have been meeting weekly on the same evening and within a short distance of one another. The combination is to be known as the South Suburban and Catford Photographic Society, and the meetings are held every Wednesday at the Plough Hall, Lewisham Obelisk, S.E., where the South Suburban has met for the past fifteen years. The vice-presidents, committees, and hon. secs. will act together, with Mr. P. R. Salmon as president and Mr. H. H. Featherstone as vice-president, until the annual meeting in April next. The joint secretaries are Mr. H. D. Fretwell, 10, The Grove, Greenwich, S.E.10, and Mr. Frank Coleman, 24, Ennersdale Road, Hither Green, S.E.13.

Big-game Photography.—The most-talked-about photographs in the National History Section at the Royal Photographic Society's Exhibition are three East African big-game subjects taken by Mr. M. Maxwell, who, the daily papers state, is out in Africa again with camera, motor-car, and gun. Naturalist photographers will be interested to learn that some of Mr. Maxwell's wonderful work has just been put on public exhibition in the Natural History Section of the British Museum at South Kensington. This is an exceptionally fine series of photographs—measuring about 4½ ft. by 2½ ft., and it is to be found round about the Darwin statue, in the main hall.

One photograph, showing an elephant in dense thorn bush, illustrates how difficult it is to detect the animal amid such tropical surroundings, while another shows an elephant standing conspicuously in the open. To get this Mr. Maxwell, we are told, had to reach the scene at dawn, before the herd took to the bush. In one instance an elephant has been photographed just at the moment when he detected the presence of the photographer, while another scene shows the huge creature getting restless, and in the act of swaying one of his legs in a characteristic attitude of indecision and suspicion.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

IRIS AND WATERHOUSE DIAPHRAGMS.

To the Editors.

Gentlemen,—In the condensed report of Dr. Clay's lecture it is stated that the iris diaphragm was first fitted to photographic lenses in 1882. This is not quite correct, as in the English version of Monckhoven's "Photographic Optics," published in London in 1867, on page 134 there is a diagram of Petzval's orthoscopic lens, which shows in both section and elevation an iris diaphragm of six leaves having a range in the size described of from *f*/8 to *f*/30.

With regard to the Waterhouse diaphragm, I believe that the gentleman whose name it bears only claimed the improvement of the projecting tang and the slotted rack jacket. The original form of Lake Price necessitated racking the diaphragm slot out beyond the jacket when it was necessary to change the diaphragms. I still have a pair of portrait lenses fitted with these early diaphragms.—Yours faithfully,

EDGAR CLIFTON.

JOHN WATERHOUSE, OF HALIFAX.

To the Editors.

Gentlemen,—You ask in an "Ex Cathedra" paragraph (page 613) for some particulars of John Waterhouse, the inventor of the "Waterhouse" stop. Twenty-five years ago, when at Halifax, I interviewed several of the then old hands who knew most of the Yorkshire worthies, and I was told that in 1855 Waterhouse investigated the problem of toning prints and introduced a "non-acid solution of gold chloride." The alkali he used was potass carbonate and he used "more or less of it according to the tone desired." According to Mr. Jerome Harrison, the process Waterhouse invented was that published (in 1856), in the third edition of Hardwich's "Photographic Chemistry," and subsequently recommended in a paper read by Mr. Hardwich before the London Photographic Society (see "Photographic Journal," Vol. 5, p. 95).

One Halifax septuagenarian was of opinion that John Waterhouse—of whom he had heard but never knew—left his native town for London, but I cannot believe he did so. Had he come to London more would have been heard of him.

In your paragraph you refer to the "small projecting piece" on the stop "which in later years was marked with the F No." I have looked through old handbooks and catalogues, and the earliest picture of a Waterhouse stop with F. No. lab that I can find appears in the 1863 edition ("Preface" is dated April, 1863) of Monckhoven's "Popular Treatise on Photography," translated by W. H. Thornthwaite. The chapter on lenses and stops deals with the older type of "ring," or loose diaphragm, and makes no mention of the "Waterhouse" pattern, but on page 45 there is a footnote which illustrates and describes "a new form of pierced lens mount for use with a series of diaphragms," namely, the "Waterhouse" pattern with projecting piece.

Maybe the whole story of John Waterhouse is buried away in the pages of some badly indexed book.—Yours faithfully,

A. S. JENNINGS.

PSYCHOLOGY IN THE WORKROOM.

To the Editors.

Gentlemen,—Mr. J. Effel dealt recently and in an interesting manner with the psychological aspect of studio work, but something might be said about the psychologist in the darkroom and printing-room. In these places accidents and mistakes will not grow fewer until we realise the fact that there are in the photographic world assistants who are born to trouble, and who sooner or later make the most terrible mistakes and have the most devastating of smashes.

Some assistants are foredoomed to accidents, and the problem is to find the "bad-luck" workers before too much damage is done. Most of us buy our experience in a very dear market, and it is hardly possible—at present, at any rate—to formulate tests by which applicants can be classed as good, average, and dangerous. Something of this kind was done a short while ago when a firm of caterers engaged a psychologist to weed out the "accident waitresses" from their many branches.

Accidents will happen in the best-regulated studios and workrooms, but many such accidents are due to carelessness. An assistant may go for years without breaking or scratching a negative, smashing a dish or measure, over- or under-printing, exposing on an empty dark slide, etc., while another worker may make a daily habit of doing these things. In a Paris studio in which I was once engaged there were twenty-six hands employed in the dark-rooms and printing-rooms, and changes were frequent. Each applicant for a post was, as far as possible, given a trial and carefully watched. He was made to handle negatives very quickly and purposely flustered, the principals being strong advocates of what may be called the science of industrial psychology. The idea was perhaps a little severe to an unsuspecting would-be assistant, but with large negatives—about 20 x 16 in.—of Louvre and other paintings the principals had to be careful in selecting their men.

J. V. S.

PURITY OF HYPO.

To the Editors.

Gentlemen,—On page 611 of your issue of October 6 you record an announcement made by Mr. W. G. U. Woolcock on behalf of the Association of British Chemical Manufacturers. This announcement may give your readers the impression that the "pea crystal" quality of hypo is generally inferior in purity, and an injustice would thereby be done to those British manufacturers who have been sufficiently enterprising to instal modern crystallising plants capable of producing this quality.

Whilst it is not possible to draw any conclusions regarding purity from the appearance of a crystallised product, and whilst it may be true that isolated samples of pea crystal hypo may be found upon the market which have a lower purity than the small crystal kind, as a general rule it may be stated that the uniformity of crystal size and shape in pea crystal hypo is strong evidence of careful manufacture, and more often than not the pea crystal quality will be found to be of the highest purity.

Personally, I always use pea crystal hypo or cube crystal hypo, because of its uniform quality and the readiness with which it can be handled. It runs "freely, and is usually dry. It is easy to weigh off and dissolve, and is never dusty.

The quality of hypo I am at present using, i.e., "pea crystal" of British manufacture, is certainly of a very high degree of purity and is, moreover, perfectly free from insoluble impurities.—Yours faithfully,

HUGH GRIFFITHS, B.Sc.

15, New Bridge Street, London, E.C.4.

THE 1923 P.P.A. CONGRESS.

To the Editors.

Gentlemen,—I am sure that no one doubts the great consideration that the Committee of the P.P.A. would give to any suggestion we sent direct to them, but if Mr. Speight had sent them his letter, instead of to you, it would have been only *one* complaint. By your publishing it, it has induced several other members to join him, each possibly having previously thought that he was the only one inconvenienced. A ballot of members would find out how many do favour the Spring Congress.—Yours faithfully,

T. EVERITT INNES.

The Studio, St. Petersgate, Stockport.

To the Editors.

Gentlemen,—Permit me to thank your four correspondents for their excellent letters in your last issue, protesting against another

Autumn congress. The letter from Mr. Alfred Ellis conveys the impression that he considers the subject is not a suitable one for your columns, but I maintain it is. Such an important matter is not to be settled by a few members writing to the Council. The question is of interest and concern to the whole body of the P.P.A., and even to the profession generally; for are not all professional photographers eligible for membership, and is not the Congress our most attractive asset?

For these reasons the controversy should have the publicity that is derived from the wide circulation of your journal.

There is nothing to be secretive about, for the point at issue is a plain one without complications. Here it is in a sentence: Would another September Congress meet with the approval of a majority of the members of the P.P.A.?—Yours faithfully,

JAMES SPEIGHT.

The Studio, Sutton Coldfield, Birmingham,
October 16.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

G. A.—We advise you to write to Messrs. G. and E. Russell, 202, Northfield Road, King's Norton, Birmingham.

H. E.—The best man for making your carbon colour prints is Mr. Samuel Manners, c/o Messrs. Raydex, Ltd., 71, Lavender Hill, London, S.W.11.

H. H.—We should think your best course would be to take up classes at the Regent Street Polytechnic, London, W.1, where you would be able to get instruction in all branches of the work, both in the studio and dark room.

J. R.—In all probability copyright has expired, but it is rather a complicated question since the engraving may be either an original one, or one made from a painting. If there is still copyright in the painting, it will be an infringement to make a copy of the engraving.

G. A.—To blacken your iron stops, clean off all the old black with fine glass paper and polish with tripoli. Then make the following solutions: Dissolve 40 grs. silver nitrate in 100 minims of distilled water; also dissolve 40 grs. of copper nitrate in 100 minims of distilled water, and mix the two solutions. Dip the stops in this mixture and let them dry. When dry they should be heated on a sand bath until they assume a fine black colour.

J. L.—The formula for a clearing bath for negatives, but using citric acid, is as follows:—

Alum	1 oz.
Citric acid	1 oz.
Ferrous sulphate	3 ozs.
Water	20 ozs.

The negatives should be immersed for about 20 minutes. If you wish to use sulphuric acid, replace the citric acid above by half an ounce of dilute sulphuric acid.

A PRESS PRINTER.—Your trouble is that sulphur is being deposited after a certain amount of hypo. has been used up in fixing the prints. We advise you to discard the formula you are using and make up the following:—

A.—Hypo.	4 lbs.
Potass metabisulphite	2 ozs.
Water	160 ozs.
B.—Chrome alum	8 ozs.
Water	160 ozs.

Mix the two solutions.

J. C.—About the best book for you is the "Writers' Year Book," published by Messrs. A. and C. Black, 4-6, Soho Square, London, W.1., price 3s. 6d., which gives the names and addresses of practically all the periodical publications which use contributed articles, and also photographic and other illustrations, together with their preferences in these respects. Another very useful book is "Willing's Press Guide," published by Messrs. James Willing, Ltd., King Street, Covent Garden, London, W.C.2, price 2s. Our publishers do not supply these books, but you can obtain either of them direct, if still in print, or through any bookseller.

F. F.—A formula for a combined developer-fixer for ferrotype plates is as follows:—

Hydroquinone	½ oz.
Soda sulphite	4 ozs.
Soda carbonate	4 ozs.
Hypo	8 ozs.
Liq. ammonia .880	2 fl. ozs.
Water, to make	40 ozs. fluid.

Addition of more ammonia to the developer gives more vigour. The plates develop (and partly fix) in two or three minutes. They can then be examined in daylight and fixed in plain hypo.

J. S.—Your dishes may be waterproofed by painting with the following mixture:—

Resin	3 lbs.
Plaster of Paris	8 ozs.
Red ochre	8 ozs.
Linseed oil	8 ozs.

Melt the resin over a gas ring, taking care it does not catch fire, and then add the other ingredients in the order named. The mixture should be applied hot, and the wood should be dry and warm. Brush the mixture well into the wood, especially at the joints. Reference to this process may be found in the "B. J." of August 20, 1920, p. 515.

H. K.—(1) The chief reason is that these direct positive cards are very much more thinly coated than ordinary plates or papers, so that a very short washing removes the excess of hypo. Also many of the emulsions for these cards are prepared with collodion instead of gelatine. We think it is plain that the particular samples you send are made with a collodion emulsion. Again, the hypo is much more rapidly removed from a collodion film than from one of gelatine. (2) No, it is a totally different process. The negative is developed in the ordinary way and then, without fixing, dissolved out and the remainder of the silver emulsion then treated in a developer which produces a positive. (3) The Photostat machines are supplied by the Kodak Company, Kingsway, London, W.C.2, who also supply the papers used with them.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3260. Vol. LXIX. FRIDAY, OCTOBER 27, 1922. Price Fourpence.

Contents.

SUMMARY.

Mr. J. Effel, in a further chapter on studio portraiture talks of accessories and backgrounds, and has some useful advice to give in a lively vein on the abandonment of the atrocities which may still be found in some studios, in the shape of both accessories and backgrounds. (P. 647.)

In a contributed article "Thermit" narrates some of his experience showing the directions in which the province of the professional and commercial photographer is invaded by amateurs, often possessing more confidence than experience. (P. 649.)

A very educated demonstration of art principles in the furnishing of the reception room was given before the last Convention of the Professional Photographers' Association of America, when the demonstrator, Mr. Ross Crane, of the Art Institute of Chicago, showed the great effect producible by study of design and colour in furniture and wall coverings. (P. 650.)

In a leading article further consideration is given to the general principles which, in common law, govern the relationship of master and servant. The present article deals especially with the circumstances of terminating an engagement and with the duties which a master and servant owe to each other during the period of employment. (P. 646.)

The chief precautions in the use of flashlight for groups are the subject of a paragraph on page 645.

Some hints on photographing exhibition fowls are given by a contributor to "American Photography." (P. 653.)

The text has now been published of the decision of the Referee under the Safeguarding of Industries Act respecting the classing of gallic acid as a fine chemical. By the decision gallic acid is restored to the list of fine chemicals protected by the Act, after having been removed from its original place therein by the Board of Trade. (P. 654.)

Bromoil prints may be inked up with a roller according to the technique described on page 646, although the dirtiness of the manipulation will discourage most people from adopting this method.

A recent patent describes an elaborate machine on the lines of the Linotype type-composing machine, but designed for producing negatives, on plate or film, of lines of type matter, which can then be printed for reproduction by lithographic, offset, or other process. (P. 655.)

A contributor to "Assistants' Notes" attributes the surface markings in the form of minute specks, sometimes produced on glazed prints, to the use of excessive hardening of the emulsion, or to too much pressure in squeegeeing. (P. 654.)

While a hot water radiator is an ideal means of warming the dark-room, the very necessary temperature of about 60 deg. F. may be secured with an ordinary blue flame oil stove. (P. 646.)

A correspondent raises the question of the preferable use of a yellow safelight, instead of red, for the handling of bromide paper, on account of the red-sensitiveness sometimes encountered in bromide paper. (P. 659.)

EX CATHEDRA.

The Election. Printers and photographers are, perhaps, the only two large classes of people who stand to benefit directly from the general parliamentary election, which will take place on November 15. In a series of contests throughout the country, which in all probability will turn out to be unique in the experience of the present generation, owing to the greater number of parties appealing to the electorate, the claims of candidates are certain to be very actively canvassed, and photography will probably play a larger part within the two weeks which have now to pass, than it has done in previous elections. It may reasonably be supposed that the very considerable proportion of women in the electorate of the country will prompt election agents to bring the personal characteristics of candidates before the voters, as can be readily done by the circulation of postcard portraits. The time is short, but it will not surprise us to hear that photographers able to supply numbers of postcard portraits promptly, or to obtain them from one or other of the firms which make a specialty of rapid print production, will be able to obtain plenty of business between now and the date of polling. The poster portrait is another form of election propaganda in which the photographer is concerned, and in the production of which he can draw upon the assistance of at least one firm, Messrs. Hood, of Middlesbrough, who for many years have included this work among their branches of photo-engraving.

* * *

Flashlight Groups. Unless the studio be provided with a somewhat extensive half-watt installation it is not easy to take large groups in the evening or on dull days, since the lighting, which is adequate for one or two figures, does not give a sufficiently diffused and powerful light. In such circumstances flash light can be made to do all that is needed, and, if properly managed, the results should be equal to daylight exposures. The principal points to be observed are to fire the flash at a sufficient height, say, eight feet from the floor, to keep the sitters from looking up at the source of light, and to have the studio as brightly lighted as possible while focussing so that the pupils of the sitters' eyes are not unduly dilated. Careful experiment must be made to ascertain the minimum of powder which will give the necessary exposure, many groups being spoiled by overlighting. A dilute developer should be used and the negative kept rather on the thin side. It must not be forgotten that the quantity of powder used varies with the diaphragm aperture. Thus twice the powder necessary for *f* 16 must be used if the aperture is reduced to *f* 22. For this reason it is desirable to use an anastigmat and to take full advantage of the swing back to obtain the necessary depth.

Warming the Dark Room. Even if we allow that the comfort of the operator is a matter of no consequence, the maintenance of a reasonable temperature in the dark room is essential to the production of uniformly good negatives. The old-fashioned practice of taking a jug of hot water with which to dilute the developer is a haphazard way at the best. It is far better to raise the temperature of the room to, say, 60 degs. Fahr., so that solutions which have been kept therein will be nearly at average summer temperature. If the building be provided with hot water pipes it is worth while running a branch into the dark room, but, failing this, a very good substitute will be found in an ordinary blue-flame oil stove, which should be placed under a bench by the sink, so that no light can reach the plates. It is advisable to remove part of the wooden top of the bench and to replace it by a slab of the asbestos sheet now so commonly used for partitions and roofing. This is incombustible, and will not warp. And it is not a good heat conductor, so that there is no danger of burning the hands, as would be the case with metal.

* * *

Roller Inking Bromoil Prints. The usual method of inking Bromoil prints, by means of a brush, becomes a tedious business when several prints have to be prepared quickly. Some degree of skill is also needed to obtain a good even deposit of ink on the print, more especially with subjects consisting of a large amount of shadow. These difficulties may be overcome, however, by inking the print with a roller, although the operation is such a terribly dirty job, that there are probably few enthusiasts, even for Bromoil, who will care to undertake it more than once. The whole of the surface is covered with a thin layer of ink, and after allowing the print to become partially dry, it is placed in hot water, and its surface gently rubbed with a wad of cotton wool or a brush. The ink now leaves the print in proportion to the image and a straight copy of the original bromide is obtained. This process differs very slightly from the ordinary Bromoil technique, bleaching, etc., taking place in the usual manner. The bromide print should, however, be upon a paper which consists of a fairly stout base; one which will stand the Bromoil transfer process will be found satisfactory. The print having been bleached, fixed and washed, is blotted off between fluffless blotting paper, and laid, film upwards, upon a sheet of glass.

* * *

The Ink. For inking any good quality lithographic ink may be used, but it has to be thinned down, before it is applied to the print. The best thinning medium is rectified turpentine, not the usual painters' variety, but the purified product sold by druggists. The ink should be rubbed down on a stone or glass slab by aid of a palette knife, and sufficient rectified turpentine added to produce an ink of the consistency of thick treacle. The roller used, is the ordinary proofing roller of the printer, and it should be charged by rolling over the ink on the slab several times, until a good coating is obtained. This is then applied to the print and rolling continued from end to end, until the print is evenly coated all over. Practically no sign of image will be seen, the surface of the print being completely covered with the ink. The print is now hung up for a while to allow the turpentine to evaporate. It is somewhat difficult at first to judge exactly when this has occurred, but it may be taken as a guide, that when the paper of the print is barely dry, the ink is in such a condition that further work may be attempted. The print is now placed, face upwards, in water, at a temperature of about 100 degs. F. After soaking for three minutes, the surface of the print may be wiped with a piece of cotton wool or lint, taking care to keep the print under water all the while. The ink will now be found to come away on the wool from the high-lights first, and then proportionately from the half-tones and shadows, and wiping should be continued until the full image has been "developed." As the wool becomes charged with ink it may be discarded and a new piece used. A flat camel hair brush is useful for removing the ink, as it has the advantage of giving a cleaner result, but it soon gets charged with ink, and is rather difficult to keep clean. Several brushes, therefore, would be needed to complete a print of moderate size.

SOME NOTES ON THE LAW OF MASTER AND SERVANT.—II.

In a previous article* the writer endeavoured to convey the point of view of a lawyer in considering questions affecting employer and employed, particularly as regards the establishment of this relation between two people and its termination. In the present article the latter aspect of employment is the subject of some further examination and the conditions of service in their relation to common law are also considered.

A servant may be summarily dismissed without notice for (1) wilful disobedience to a lawful and reasonable order; (2) misconduct inconsistent with the due discharge of his duties; (3) conduct outside the servant's employment rendering it unsafe for the master to retain him in his service; (4) immorality involving forfeiture of trust in the servant; (5) insubordination incompatible with the continuance of the relation; (6) habitual negligence; and (7) incompetency in performance of any skilled employment for which the servant was engaged, and the master may similarly terminate the employment if the servant becomes, through illness or accident, permanently incapable of performing his duties, though mere temporary incapacity will not give this right nor entitle the master to withhold wages. It is well settled that the master need not tell the servant on what ground the dismissal is based and that even if, at the time of dismissal, he knows of no good ground for the dismissal, he may justify his action if, subsequently, he discovers some act or omission on the part of the servant which would have formed a sufficient ground for terminating the employment summarily, if, at the time, he had been aware of it.

The servant may quit his employment without notice (1) if he has reasonable ground for apprehending that continuance in it will expose him to danger of loss of life or personal injury; (2) if he is subjected to severe ill-treatment by the master, and (3) if the master fails to carry out his part of the contract, as, for example, by refusing to pay the agreed wages. It is to be noticed that failure on the part of the master to perform his part of the contract puts an end to the entire contract, so that the servant is not only freed from any obligation to continue in the employment, but also from any collateral term of it, such as a restriction on his right to carry on business in competition with his late employer.

A servant who gives his master cause to dismiss him summarily or who leaves his employment without proper notice or justification may find himself in an unpleasant position from a financial point of view, for not only will he lose the wages which he would otherwise have earned, but he will also forfeit the wages for the period which

* "B.J.," 1922, October 13, pp. 614-615.

has elapsed between his last pay day and the date of leaving his employment, although he will, of course, be entitled to any wages which may actually have become due to him before the termination of the contract and remain unpaid. Moreover, it must be remembered that in no case is a master under any obligation to give a servant a character, though if he gives one he must be careful that it is accurate.

Having seen how the relationship can be created and terminated, it may be useful to consider the duties which master and servant owe to one another during its continuance and on its termination. In the first place, although in his own interests he is likely to do so, the master is, generally speaking, under no obligation to provide work for the servant to do, except where (as in the case of a servant paid by commission) the remuneration depends upon the amount of work done, so that, so long as he receives his wages or salary, the employee cannot complain if he is kept in a state of enforced idleness. On the other hand, apart from such recent legislation as the Shop Hours Act (which, however, only applies to persons employed in shops as defined by the Act) the law does not recognise any right in the servant to require a holiday, though, of course, a holiday or holidays may be stipulated for at the time of entering into the contract, or may, by reason of the general custom of the class of business in which the servant is employed, be deemed to be an implied term of the contract. For instance, the weekly half holiday is now so generally recognised in all classes of business that it is practically certain that the Courts would uphold the servant's right to it, unless such right were expressly excluded by the terms of employment. The law will not permit the servant to be put to expense in carrying out his duties, and consequently the master must indemnify him against all expenses and liabilities incurred in obedience to orders or in the reasonable performance of his duties. This, of course, does not mean that a servant can require reimbursement of extravagant payments made by him in the course of his employment. For instance, a servant who is sent from London to Brighton to take a series of photographs would not be justified (in the absence of very exceptional circumstances) in hiring a car for the journey or staying at a luxurious hotel when other reasonable accommodation was available, and the master, in such a case, would be within his rights in refusing to allow him more than the third class return fare and reasonable hotel expenses. If the servant, pursuant to orders, carries out some transaction which he knows to be unlawful he must take the full consequence of his acts and cannot look to his master to indemnify him against any liabilities which he thereby incurs towards third parties.

A servant must obey his master's lawful commands, take proper care of his master's property committed to his charge and use reasonable care and skill in the execution of his duties, and failure to do so may not only justify his summary dismissal, but may also expose him to liability for damages at the suit of the master.

Unless expressly restrained by the terms of the contract of service, a servant is at full liberty, after his employment has come to an end, to set up in business in competition with his late employer and, in such business, to use the knowledge he may have acquired in the course of his employment. He may even ingratiate himself with his master's customers during his employment with a view to securing their custom after the employment ends, but he must not during his employment surreptitiously make lists of his employer's customers and then canvass them for orders when he sets up business on his own account, and if he attempts to do so the Courts will restrain him on the ground that he is guilty of a breach of faith.

It has already been stated that, by the contract of service, restrictions may be placed upon the servant's right to set up business in competition with his employer after the employment ends, but such restrictions are very jealously regarded by the Courts and the servant will be released from them if they go beyond what is reasonably necessary for the protection of the master's business.

G. E. S.

WITH A PORTRAITIST IN THE STUDIO.

[In the present paper, of the series of articles by Mr J. Ettel, which has been appearing in recent issues, the author talks of accessories and backgrounds, and, from instances in a wide experience, urges the abandonment of the many artificial accessories still to be seen in portrait studios. The next article of the series will deal with hands and feet and full-length portraits.]

IX.—ACCESSORIES AND BACKGROUNDS.

In at least one particular the photographer is worse than the criminal, for the law breaker may be guilty of using an accessory *after* the fact, but the studio worker has seldom such refinement of artistry, the accessory invariably preceding the sitter in composition.

We have to think of things and words in their real significations if we are to get out of conservative error and stagnation; slip-shod definitions, and meanings accepted because they have been current for so long that the timid are afraid of change, count for nothing to the man with a mission. All around us are evidences of change great dynamic forces are at work everywhere; only the studio is static. Ask Snapshotte what an accessory is, and he will tell you it is a garden seat or a French window, or some other contraption in "paper mashy," and maybe he will add that you are a fathead not to have known that long ago. Now, even at the risk of incurring Snappy's impatience with my ignorance, I will be humbly bold, and affirm that an accessory may be more than plaster of Paris, and a background something different from a painted screen that is like nothing on earth.

I would define the word "accessory," used in the studio sense, as anything, other than the wearing apparel, that assists or contributes in any particular to the picture. The photographer's first duty is the production of a likeness—indeed, in many parts of the country he is still spoken of as the "likeness taker" and the face and clothed figure of the client should be considered before the Grecian pillar or the Handel stool. In most things I have the courage of my passion, and if I placed great reliance on the use of accessories in my portrait work I would give my pictures suitable titles, "Study of an oak settle, with lady," "Perambulator and child," "Rembrandt effect of bookcase, with 'B.J.' Almanac disclosed, also clergyman reading same," would strike you as being frightfully silly, but they would nevertheless be eminently descriptive of the class of work I have in mind. Yes, we may deplore the criminal's unsocial acts, but we must count it unto

him for righteousness that in the use of accessories he can prove an object lesson for most portrait photographers.

We only fully realise the enormity of the accessory offence when to its hideous incongruity is added what is spoken of as "the background." There was an old photographer in my youthful days who had a great love for a curtain. He dressed it up in many different ways and got some variety out of it, but his operator and he used to have heated arguments. The young man would try all he could to get rid of the velvet drapery, but with little success, for just as he was about to expose the boss would creep into the studio, and whisper loudly, "Introduce the curtain, introduce the curtain." Indoor or outdoor subject, it mattered not, the old man was obsessed by his one great adjunct to a successful portrait. It was in vain that the operator told him that introductions were superfluous between acquaintances of long standing. Sarcasm was wasted on the old die-hard whose last words most likely were "Introduce the curtain."

After all, a curtain is not an unlikely background; it is certainly mobile, and can be wheedled into quite a number of effects. But when we think of the painted canvases on rollers or stretchers, representing every phase of nature from a snow scene in Switzerland to moonlight in the Lake district, and every style of apartment except a kitchen or a parlour, we are driven to the conclusion that it is a work of necessity to make the photographer see himself as others see him; assuredly he must be made to feel that distempered rags and plastered boards do not a picture make, and that what is wanted is not the introduction of a new background or accessory but the infusion of new thought into his theory and practice of the profession of portrait maker. I have had many a good laugh at our studio properties; indeed, I have seen so much of the humorous side of the business and have found so many stodgy fellows in the trade that I have come to the opinion that they need to be shaken up a bit, and made to laugh at themselves, their work and methods, the little ways of clients and the world in general.

There may be said to be two ways of judging an accessory or background—its resemblance to what it purports to be, and its suitability or otherwise in conjunction with the subject. The seascape might be a good piece of work, but a lady in evening dress with the waves about to rush over her ankles would not be quite happy. The inlaid escritoire is probably good furniture, but it is out of place in a corn field with a sailor standing by. Let us consider intrinsic values, and then relativity in accessory and background.

Pieces of furniture in use in the studio are invariably of two kinds—ordinary chairs and tables of a drawing room nature, and seats, stools, fancy tables, etc., which are never met with outside a photographic studio, which are seen in nearly every gallery, the pious belief having been sedulously fostered that the manufacturers have specially designed expensive and uncomfortable furniture to make easy the work of the portraitist. There seemed to be more honesty in the old days, for we spoke frankly of "the posing chair," with its different backs and detachable arms. The "posing" was limited by the combinations of various padded parts, and we were quite satisfied that nowhere else but a studio could there be found anything like this chair, unless possibly the shop of an unsuccessful country barber. The words "swank" and "camouflage" were unknown in those albumen days; Smith and his rival, Brown, had the same mounts, the same paper, the same collodion enamelling or burnishing, and, of course, "the posing chair." Standardization and conformity were guiding principles then, just as individuality and originality are commendable qualities to-day. Undoubtedly there are scores of photographers professionally engaged at the present time whose work can take a proud place in the world of art. But is the average practitioner, with all his magnificent resources, anastigmat lenses working at large apertures, studio cameras with movements controlled by a simple touch, plates of phenomenal speed, unlimited light of supreme actinic quality at hand at any hour, is his average output far removed from that of the posing chair epoch? Unhesitatingly, I say that with all his opportunities the results do not favour the modern. Immediately, I am only concerned with the consideration of accessories and backgrounds. I wish to point out that, instead of bringing delightful variety into our work, a heterogenous collection of posing material has actually defeated the object for which, ostensibly, it was created, and that the average work to-day shows no advance whatever on that of thirty years ago. And the criminal could put the photographer into the straight path of artistic regeneration, for it is largely a matter of accessory.

As the Snapshottes make a distinction between studio furniture and accessories, we will first consider those pieces about whose function there is unanimity, the things of lath and plaster and papier mâché. The garden seat is a pretty firm favourite. I do not remember any time in my life when I sat on a stone seat, unless it be when I caught cold sitting on the wishing chair at the Giant's Causeway. I understand that stone seats may be found in the old-world gardens of magnificent estates, but my ducal friends will never persuade me to experience their discomfort. A studio stone seat, being wood, is less unkind to the person. I must say I prefer it to the lighter make of "garden seat" with open spaces nailed together, for the stone variety makes an excellent table for a quick lunch, but to spread a paper on the ribbed style is to court disaster when laying down your cocoa hurriedly to answer a foolish intruder. You may say there are other uses for garden seats; and that is correct, for, when hanging backgrounds or adjusting blinds, they are more suitable than Chippendale tables to stand on. Longfellow, in "Hyperion," writes delightfully about ruins. A stone seat has no dignity until it is a ruin. It is at its best when it is moulting, and going bald, when decrepitude has gripped it by the knees, and Time (or a mischievous child) has rotted away the nose of one of the gargoyles in whose mouths, in times of war, Tommies were wont to stick their fags.

If you have to take a group of persons in holiday garb, I can see nothing wrong in the use of the stone seat, if a good outdoor scene is used in conjunction, but for goodness' sake don't take the clumsy thing into the conservatory.

Let us look at both sides of the question; turn the seat round, and we are confronted by a bridge. Surely there never was such a diminutive bridge, barely 4 feet in length, and built of stone withal, the interstices having been so carefully plastered to resist the ravages of the years that one instinctively wonders what turbulent Niagara or seething cauldron is spanned by this arch. But the bridge starts from nowhere, leads nowhere, and sitters are generally posed in front of it, for it only spans the studio parquetry (linoleum). The bridge is seen at its worst in the library; let us, with stony indifference, leave it there.

Independence and an air of detachment seem to be the outstanding characteristics sought for in accessories—bridges with nothing to bridge, gates hinged on space and opening on cumulus clouds, marble pillars isolated on the sea shore, and the baby seat in the middle of the high road at the mercy of char-á-banc and cow. Even when linked up into combinations, there is little *esprit de corps* among the component parts, stone walls disclose brass hinges, balustrades which detest pretence, and threaten to give us away, have to be kept upright with plate boxes and Houghtons' catalogue.

I have lived years in France, but I was unfortunate with the windows there; they were nothing like the real "French windows" I had to manipulate when an apprentice in this country. In studio practice the window is, of course, on its own; a wall on each side would destroy the illusion. I have known a cranky worker who introduced side wings with his window, but the curtain, which was placed at the left side, true to tradition, gaped at the join, and the oak panelling

(simulated on canvas), the bulwark of the right flank, was squeezed so much into contact that the panels looked like spirals. Luckily, most photographers are not such sticklers for realism. In France they have glass in their windows, a fact which our photographers seem to ignore, for hands are always placed holding the sash in an impossible way if we are to think of it as glazed. Whether a lady is looking out of the window or looking into the room is difficult to fathom, the background last in use being usually employed. We all know that a figure silhouetted against the sky and gazing into a comparatively dark apartment would be all in shadow, yet we never see window studies in that key; one may also be perturbed by the problem of where the camera was that took a picture outside the *quatrième étage*, but that is to be too dashed particular.

There is a piece of furniture beloved by photographers which seems to have no name in the English language. I call it the four-legged tripod, and that's about the nearest I can get to a description of it. Women are supposed to stand at this flimsy affair reading Kodak's monthly, or threading paper daffodils into a sixpenny vase, supremely unconscious of the surroundings. I have one of these pedestals in my own studio, but its number is up. I had it hidden away, but my ambitious assistant, George, ferreted it out, and I haven't the heart to kick it to bits. I drew George's attention to the fact that one leg was falling out, and the well-meaning ass went and glued it up beautifully, instead of making it a complete cripple. One dark night I will remove the offence, for a namesless piece of furniture, flimsy and angular and cheap, which may be seen in thousands of showcases, ought not to be used in any progressive studio.

Hundreds of books have been written, and endless controversies waged round the subject of Hamlet's mentality. There can be little doubt about his state of mind, for a youth spent among Hamlet stools would make anyone dotty. Happily, his sojourn in England in pre-studio days restored his health. Nowadays he would be in Colney Hatch in a fortnight. I am not a culchawed person, and I plead guilty to knowing nothing about Looee Catoars or Loosee Sez or the Jackobeans, and really don't want to know anything about them. Some people object to you mixing your drinks, and others to mixing your furniture. I am easy both ways, but there are limits to everything. Stone seat, oak chair (showing large brass screws where the arms are detachable), Sheraton table, and "grouping stools" which seem to have been made from cigar boxes, make a combination frequently seen, but never in perfect harmony. It all depends what we are working for. If we are looking for fun the elements are certainly there. When I was twenty I was assistant to a well-known firm in the South of Ireland. Our clients were very good people, but periodically we had droves of rustics for whom there were special lines. The great favourite with the country folk was a full-length portrait on a 10 by 8 plate, from which cabinets were also printed. Well, the operator and I used to have competitions in complicated portraiture with these simple peasants. "I beat you yesterday" G—— would say to me, triumphantly, holding out a negative from the washing water. Then we would start counting the accessories, every chair, stool, plant, book, vase, rug, firescreen, magazine, boulder and pedestal counting as one. I didn't often win, for G—— took an unfair advantage by working a short focus lens and throwing in a view of the studio, with Noak's arks, toy horses and dolls disclosed at the sides. We never had any complaints; doubtless the customers thought they got good value for their money. These were the days of small waists for women. The negatives were generously treated with opaque and the figures "improved." This custom led to another competition, but when the waists actually got smaller than the necks of the sitters I left. I take it, however, that most times the photographer is only interested in the humorous as a side issue, his first concern being sound portraiture. If you cannot take sitters without numberless accessories you are still unacquainted with the pictorial possibilities of the human form. After all, the accessory is *not* the fact; it may be regarded as a necessary evil, but when employed it should be with discretion and taste, and not in such manner as will bring ridicule on our work.

J. Effel.

LOST BUSINESS.

Some time ago I said something in these pages about amateur opposition to professional business. I mentioned at the time how happy snappers were responsible for quite a lot of portraiture and other photography, which would have gone to the professional had there been no amateur to do it. It would have gone to the professional in any case, I think, if the average professional catered for it "loudly" enough; but, as it was, it was lost business.

Since then I have had many other examples of the same thing brought to my notice. Running a concern which caters largely for "D. & P.," I have seen more wedding groups this year than I ever saw before. All by pocket-camera "experts," who did it for the fun of the thing. But they afterwards spent, in the aggregate, quite a respectable sum on prints. And I believe that this amateur photography of weddings *does* affect the professional chance, though some are of opinion that if "contracting parties" want a real photograph they will go to a studio no matter how many snaps are taken. One experience of mine at least is evidence against this assumption. I queried a bride-to-be about taking the group, and was told that there was no intention of engaging a photographer, "as there would be no necessity. So many of the guests had cameras, you know." The only argument here is the one of quality. A good professional study is not to be displaced by any random snapping, but unfortunately the good study is not always in evidence, and some snaps really have a lot of good points.

Another case that came to my notice was one in which an estate agent required a series of photographs of houses and other premises which were in the market. The whole issue was done by a "snapper," and not only that, the prints which were used for advertising were not turned out by a trade finisher, but printed on self-toning by the taker.

The foregoing case is put in the shade, however, by the firm of furniture manufacturers who periodically handed a spool to a certain dealer. These spools, when developed, showed various pieces of new furniture "photographed" against a backyard wall, partly in focus and partly out, distorted and "colourless." But, bad as they were they continued to appear at intervals.

Machine photographs by amateurs are not at all uncommon. The negatives come along for painting out or enlarging. Sometimes they are really good, but they are never equal to the work of a man who does this sort of thing for a living.

Home pictures and home portraits, as might be expected, are very common subjects with most camera users, but I doubt if the professional who complains of slack business realises the amount of money spent on these items. At the present time there are many tracts of our time rural district which are now covered, and being covered, with corporation dwellings. These places are not invariably such as to incite the photographic instinct, either business or amateur, but nevertheless the majority of the dwellers therein appear to want their walls and gardens pictured, to say nothing of themselves and their children. Much film has been used this summer on these same walls, etc., and the most of it with lamentable results. I suppose that many

of the new suburbanites are also new to snapshotting, but they are certainly anxious to see themselves and their new homes on paper.

And home portraiture proper is becoming an item with amateurs. I was recently asked if I could produce "real professional pictures" from some film negatives which had been taken by young ladies in their boudoirs. As these were fairly good I said I could—at a price. This is, of course, quite legitimate business provided there is no cutting, and in this case there was no objection to the terms I quoted. The results—after a little retouching and enlarging on a carefully chosen paper—elicited the remark that "They were every bit as good as the best studio productions, *but much more lifelike*." Now there is something to make one think here. As regards the first part of the comment, well, I served many years in studios in my time and suppose that I ought to be able to make a "studio production." But the lifelike quality was due entirely to the fact that the sitters were taken under such intimate conditions, each one by her own bosom friend. There was no professional business atmosphere about it. But—and this is a big but—had the same negatives been on half-plates, and exposed by a professional photographic artist, they would have been much better in many ways, and, consequently, what were at the most good portraits would have been works of art as well. But, you may say, that would have brought in the detrimental "business atmosphere." Not necessarily. It would depend on the photographer. One may be a stranger to a customer, but it is quite possible to be a pleasant stranger and get along with him or her as easily as if one had been known to the person for years. The actual business would be done at the initial interview. The business atmosphere need not be carried into the studio or the customer's home.

Much of the photography I have spoken about might be obtained by the professional if he cared to seek it, and the last incident I shall mention is intended to illustrate this. But before proceeding, there is a point which I should clear up. Catering for amateur business I ought perhaps really to encourage the amateur rather than the professional. But there is photography which the amateur can do and photography which is best left to the man whose business it is. I do not believe in encouraging tyros to waste film on interior architecture. It does not do them, the profession, or the trade, any ultimate good. And I do not ask any professional to compete with the snapper on Blackpool beach or at the profitable—to me—charabanc picnics, which provide dozens of spools for "six of each." The professional can go after both if he likes, but it is the better fields where he is legitimately wanted.

The final case I shall speak of was one where a young lady entered a pharmacist's shop to borrow a camera. It was wanted to photograph a "spread"; in other words, a table laid out for a large feast. The counterman asked a few questions, and very sensibly concluded that the job was rather too tall for the intending photographer. He then suggested that it would be much better to consult a real photographer first, and the lady, not knowing the slightest thing about it, readily took his advice. She came to me. When I saw the table, filling the room to repletion and resplendent with colours—edibles, pottery, and floral effects—I sent back hurriedly for panchromatics and the shortest of short-focus lenses. Even then it was difficult to do justice to the job. The results, however, gave satisfaction all round, my return being a small but well-paid order. Had the young lady been left to her own amateur efforts the result would have been disappointment to her and her friends, and probably a shilling or two to the trade.

There is a type of amateur to whom the above remarks cannot be applied. It is the genuine serious worker who may have a penchant for a particular class of work. If such a one be fascinated by the "joys" of machine photography the chances are that he will obtain some excellent negatives, and if engineering friends of his take advantage of his ability we can only regret it. Certainly, in such cases, his dealer cannot be expected to discourage him. His case is totally different from that of the snapper who dabbles in things that are beyond him. At the same time the professional is always at liberty to let engineers and other business men know *his ability* to his own business advantage. The lost business that is being played with by other than professional camera users is not so much due to the amateurs as it is due to the general ignorance of professional ability and of ways and means by which to employ it to advantage.

THERMIT.

ART IN THE FURNISHING OF THE RECEPTION ROOM.

[Among the demonstrations arranged at the last Convention of the Professional Photographers' Association of America was one by Mr. Ross Crane, of the Art Institute of Chicago, on the application of principles of decorative art to the planning and furnishing of studio reception rooms. It was evidently a very effective demonstration, for the speaker was able to show in an actual room, the merits of artistic skill in the arrangement of furniture and choice of colours. In front of his audience he re-modelled a reception room by choosing fresh pieces of furniture, re-arranging and changing accents of colour. In the absence of this exhibition, the whole of his talk, as reported in the official minutes of proceedings, cannot be printed with advantage, but, in the abridged form which we give, the discourse will be seen to contain a great deal of good advice on the furnishing of a part of the portrait photographer's premises which very often could do with much closer attention, from the decorative standpoint, than it receives.]

WE started out from the Art Institute of Chicago six years ago to promote art. We had for our slogan, "Take Art to the people and the people will take to Art," and we found it true, absolutely true, but we found we had to take art to the people into their very homes, into the design of the paper on the walls, the rugs on the floor, and the furniture in the room. And we had to teach the world—here in the Middle West, anyhow—that Art was not something alien, something to be used on rare occasions, or for the lecture class, but that it entered into the useful and daily avocations of life, and we had to show it in the building of a house and the furnishing of a room and in the harmonising of the house with its surroundings—landscape art, and in the building and planning and designing and beautifying of the city—civic art or city planning.

Since I accepted the invitation to make this demonstration, I took it upon myself to visit photographers' studios and I have found varying conditions, just as you find going into our homes. One home is very beautifully arranged, and in the next one, in a house fully as elaborate and pretentious, I find an absolute ignorance of the laws of home furnishing.

I took some notes of one room for a reception room of a photographer who had been at least thirty years in the business in a large city, doing a pretty good-sized business, but not of the highest class, and he called my attention to the beauty of his rooms.

He said: "This is my studio," and I saw that he had in mind those cosy corners we used to have—some of you can remember, a Turkish cosy corner. He had a room in which the walls were in buff, and had thin panels of cherry mahogany strips all up and down, and a plate rail—relic of bygone days, which was a harbour of refuge for all the miscellaneous junk he had been able to accumulate in the thirty odd years.

On the floor were two Oriental rugs. Now I like Oriental rugs, and I use them, but these were not the right colour. They were red. There are varying shades of red. I have red in my curtain here, and on the couch, but these were the most violent, virulent, poisonous red you can imagine, on the floor, and they shrieked and yelled at everyone that came into the room. They disturbed me.

And for furniture he had quite a miscellaneous mess. All the

kinds of furniture that had been the latest thing during the last thirty years. There was golden oak, and he had gilt furniture, Chinese teakwood furniture, and some furniture of this period, and some tables, a roll-top desk in light oak and a swivel chair. He had one plush-covered chair and two chairs of the style of Charles the First—high backed, rococo, very elaborately decorated. There was no arrangement. He had two bronzes in the room. Now I believe that in a photographer's reception room there should be some evidences of whatever art may acceptably be brought into that room—pictures on the wall. I believe in a piece of bronze or a piece of statuary of some sort. This man had a bronze dog. I don't know what period that dog belonged to, and also one of these busts of an Indian girl, I don't know her name, but done in high colours; you buy them for $1.75 in any department store—in the basement.

And he had art upon the walls, and the pictures on the walls—his own products—were scattered without any arrangement at all, or any feeling of design—here and there—miscellaneous in its effect and very disturbing to the mind.

Now I speak of this one, not because it was so very bad. It wasn't as bad as some, but because of the fact that the man was so well pleased with it. He said he thought it was noble, and I couldn't tell him anything at all. I looked at it, took note of it, and said: "Where *did* you get so many things?" That was about all that I could think of.

And in the same block I went into another studio in a reception room which had all the qualities that this one lacked in fine restraint, in comfort and dignity—a room which I felt very sure represented very happily the thing that that man wanted to have people believe him to be, whether he was or not, and the chances are he was, because every room, whether it be a room in your own home, or reception room or gallery, is a confession or taste—if you have anything to do with it, it is a confession of your taste.

Photographers ought to be artists, and many of them are, but not always do we know how to apply those things we put into our pictures into the furniture of our room.

Suppose we start at the very beginning, the mental processes. I always ask myself, when I approach the problem of furnishing a bedroom or dining room or living room or photographer's room, this one question: "What is the thing for? What do I want to do? What is the thing we are trying to do?"

Now I am not in professional life nor commercial life, and, maybe, I haven't fully got just the idea supposed to be embodied by a reception room for photographers, but I believe it is a fine sense of comfort and dignity. Those two things. A little more formal than a living room in your home; in a reception room, you want a feeling of restraint, of dignity, *plus* comfort. People have to sit there for a while. Patrons come in and have friends with them, and while the patrons are getting ready for their operation, their friends remain in the reception room and look at anything they may have to look at.

I believe that the walls of that room might be used, and ought to be used to show forth some of the samples of the photographer's wares, but I don't believe that that is the place for most of it. I believe there we should employ the principle of restraint, and upon the tables we will have albums and portfolios containing a larger number of the photographs, samples of your work.

I want restfulness in that room. Restfulness is a part of comfort, always. You cannot be comfortable unless your mind is at rest.

Suppose you look at the furniture first. You have on one side a very beautiful Italian brown walnut cabinet desk, one of the most lovely things I know of, very appropriate for such a room as I have in mind. I have seen also desks of that type in walnut and oak in the Jacobean type, which fits in very well with that, and I have seen those in some of the reception rooms I have visited. The Jacobean type of furniture is used in the desks and the table and the chairs for the most.

We have in this room, besides that piece of brown walnut, some red mahogany. Now those two colours do not harmonise. I have nothing to say against this colour, but I believe that when you have that colour in one piece of furniture, it ought to be embodied in almost all the other pieces—not necessarily all of them.

That chair is of an altogether different period and colour, and this antediluvian monster here, this comes down from the Stone period. It takes up too much room in the first place, and, by the way, let me say, I am showing here a larger room than I have usually found. Sometimes I found a larger one, sometimes very much smaller, but the principles embodied can be applied to any other room.

We have also a little pedestal here of the golden oak period, which does not harmonise with anything in this room, and more than that, it is not suitable for the purpose for which it is intended. A pedestal is meant as a foundation for a bowl of flowers or for a piece of statuary, but this is very wobbly, and when I look at that I begin to wonder how soon somebody is going to knock it off and I cannot feel at rest in that room. Now there are pedestals made larger than that, with four legs, that I think are admirable and are to be used in a reception room. Flowers are not always available; they cost a good deal of money. I think in a reception room there is no reason at all why you shouldn't have a pot or two of flowers growing, provided you have any sunshine. Many reception rooms have no sunshine, and then flowers are a rarity.

We have different colours in our room. We have mulberry in the draperies and a dark mulberry in the couch. Then we have blue in this chair and green in that, and many colours. The things are rather a mess. The pictures on the wall are very well hung, but do they not relate to anything in the room; they are just put on the wall.

One of the fundamentals in hanging pictures is that a painting or a picture of any sort on the wall in a living room, at any rate, should be related to some other piece of furniture under it or near it. We put a painting over a mantelpiece, a mirror over a desk, or over a consol table, and so I find that by grouping pictures in a reception room, in groups, we get a very much more interesting result than by putting them haphazard upon the wall.

That couch is a beautiful thing, you cannot all see it, but I am going to show it to you by and by, and it very well relates itself to this piece of furniture over here—the Italian desk. This chair belongs to the desk. It is absolutely in keeping with it in every way possible.

Then we have here another type of chair, which we call the Austrian bentwood chair, which admirably fulfils a certain mission. You cannot wear it out; you know how durable they are, how well made, and how cheap, but really, that chair does not belong side by side with this. They don't belong to the same period; they are not of the same kind of wood; they are not of the same design nor spirit, and they really swear at each other. You have got to have harmony.

Here is a table which is very good indeed. It belongs to the so-called Colonial period, but it doesn't harmonise in colour of wood with my desk nor with my couch, nor that chair, and I assume that our photographer who started out to furnish this room did it by degrees; that he first had this, and this, and this. Then, suddenly, in a fit of extravagance, he bought that beautiful desk, and now he is ruined absolutely. He has got to go on now and live up to that desk. He bought the couch afterward, a very lovely couch, but having one couch there was no necessity for two. This little settee is absolutely unnecessary, and I assume that he is going to eliminate some of these others and bring in new furniture; that he has a sudden accession of prosperity. I don't know how he got it, but I want to say that the furniture I am using is a little more expensive than I think I can ever have in my own home, but the principles involved in the arrangement and in the association of the various pieces are the same whether you use Italian furniture or Jacobean or Colonial or any type. The principles are the same—the principles of arrangement and colour.

Before I can get to talking about colour and arrangement we will have to eliminate these pieces I spoke of. Even this table. I think they are going to take it home and put it in the living room because it is a very good table for that purpose.

Before we take it out, will you see the angle at which it stands? I have the desk against that wall; I have the couch against that wall, flat. The first principle of arrangement is that the rug on the floor and the large pieces of furniture ought to follow the structural lines of the room—the architecture. This room is supposed to be a rectangular room. We flared out the walls on either side so the people on both sides could look into the room, but for all purposes this is a rectangular room, and in order to get order, which is heaven's first law, we must follow the architectural lines of the room. The rug on the floor must be parallel to the wall. If you have two rugs they must be parallel to each other and to the walls, whether the rugs are large or small the same principle applies. If you want order, you can only get it by following the structural lines of the room. Our desk belongs against the wall and so does our couch. But here is one piece of furniture that swears against all other arrangement. It is on the diagonal. A great many people do this. They put the couch across the corner and the piano across another corner, but you cannot get order that way; you cannot get a feeling of design that way. So

we will eliminate this table, and these chairs I have spoken of and the settee, and I will hold these albums until we find something else that we can put them on.

Now we have brought in a table of a different type; a table which harmonises in colour of wood and in mass with that desk. You see how very much alike in the colour of the wood and in the turnings they are? Here is another piece of walnut, a little darker than the first, but of the same general type. We will put that against the wall. We will take out the settee and the little stand. We want the waste basket, it belongs here. We put the table on a line parallel with this wall. I have a wall here in front which is imaginary, but really as active as any other wall, and here I brought in a chair for colour and lines. Now we will begin at the beginning.

The two great keys to the world of beauty are colour and arrangement. Colour harmonises and unifies discordant elements. By arrangement you can take rather commonplace furniture and get a very fine and distinguishing effect, knowing the laws of arrangement.

In the matter of colour I find very many living rooms and very many reception rooms are absolutely at fault. You need one dominating colour always. In this room we are going to use a warm tone—mulberry. I have it in my draperies. I have it in the piece of upholstery; in the lamp, in the couch and part of the table cover, and some of it in the very wood of the furniture. We will call our colour for this room, then, mulberry, but we will have as a secondary colour, blue. They go very beautifully together. One or the other, either one, may be dominant.

I remember my first experience in handling colour in a living room. I was a student in Boston at the time, studying painting, and some of my relatives were about to furnish and remodel an old house, and they said: "We will ask our cousin, he is an artist (they thought I was an artist because I was studying painting), we will get him to decorate the house for us and it won't cost us so much." If they had only known how much it was going to cost them! They had to do it twice. They had to pay for my first lessons in interior decorating. They didn't know it, but they did.

We started out with the idea of colour. I found a large room—a library—facing on the north-east, not much sunshine, and I said: "A warm colour is indicated here" (speaking like a physician). Now, what are the warm colours? Well, red. Everybody knows that, so I said: "We will use red." Now if I had only gone a little further and thought of yellow it might have been very much better, but we took red. We put it in the wallpaper, on the walls, all over that room, and a library it was, but after we got that wallpaper on you couldn't see the books, and you couldn't see the people in the room, because they wouldn't come in there. Shut a sane normal man up in a room in which all the wallpaper is dark red and how long do you think it would be before he would be applying for admission to an insane asylum?

But I learned my lesson—that the deep colours and the strong intense colours are not for the large room. The first law of colour is the larger your space or area the less intense your colour ought to be. For our walls I believe a tint of colour—a tan or a little brown or a buff, or a grey, or putty, or cream, or delicate strawberry or gold. Many of those colours—and there are many of them—but not very violent. The larger the space the less intense the colour should be, and that applies also to the floor. The floor should not be violently coloured nor the ceiling. Here is a law you can put into effect anywhere—that the darkest part of the room should be the floor, and then the ceiling the highest value and the lightest colour, and the walls should be a middle value and colour. That is simple but psychological, absolutely, founded upon human experience. The floor is a background and a foundation also. It should be the darkest part of the room.

The second principle of colour is the less space the more intense the object may be. In some small object like candlesticks or candles or cushions we can have very brilliant colour. I think of the wall as the background on which a painter splashes his colours, the colours being in the smaller things. That is very natural and very likeable.

Now for arrangement. I have given you the first law of arrangement. That was about the rug and large pieces of furniture following the structural lines of the room. There is a second principle which comes in constantly, and that is the principle of balance. Things that are related to each other ought to balance each other. You will observe that we have here a fine quality of balance, a formal or bi-symmetrical balance; in the very centre we have the large tapestry. I must explain that that tapestry was not to go horizontally, the design shows that, but because I could not, in my hurry, find another of that size to fill up the space, I took this one as it is and turned it around—I have taken an artistic licence. Underneath that tapestry is a davenport which balances the centre of the stage, and then this table I have placed out in the middle of the room so that the centre of the table shall about centre on the middle of the tapestry; if I move the lamp over you find I have destroyed the balance. It should be in the middle in order that you may feel at rest about it. If I move the table a few feet to the right or left, you will begin to wonder when I am going to push it back where it belongs. We have that innate sense of proportion which Emerson said is the divinest thing in man, which makes it necessary for our comfort to have things balance each other.

I have on this side of the room a large mass—a high cabinet and over that a mirror and flanked on either side by pictures and by chairs, and I need something on that side to balance it. The large pieces of furniture and the high pieces of furniture ought not to be on one wall. They ought to be on opposite walls. Now manifestly we cannot always have cabinets that reach up high, but we can have what we call "built-up" effects. There is one we have here—the cabinet and the mirror above it, joined by book ends with the books between. On this side we have a small table which we brought in for the purpose of holding some of our albums, and we have used it as a foundation for another built-up effect, using for the centre that large black crayon picture, and connecting the table with that by means of a smaller picture underneath.

Now I believe a chair placed right here will help to fill up that space and give a sense, a feeling of design to the whole thing.

Back here we have on this wall some pictures which do not seem to have any relation to anything else in the room. I have planned with reference to these chairs. I think it is a very beautiful and dignified thing. It harmonises in colour of the wood and in the historical period with our desk, and couch, and with that table. It cost us quite a good deal of money, but not as much as you think. Those things have come down in the last few years—that is a thing of beauty and a very comfortable thing to sit in. We place it under that framed picture on the left of the room so the picture shall relate itself to the chair underneath it, and on the other side of the room we will do the same thing.

The reason why I didn't get two lamps just the same colour was because I couldn't. They weren't in stock. I would like to have had two lamps like that one on your right on either side of the davenport.

I will move this table aside so we can get the principle of balance embodied in this group in the middle. I have now one wall absolutely balanced, very well arranged for use. We have a couch in the middle with a tapestry above it that forms the centre of interest for this room.

Every room, whether it be a living-room or reception-room, should have one object of central interest—one centre of the light of that room—something that dominates the entire room. Sometimes it is a fireplace with a mantel shelf, with a picture above it; sometimes we have to build it up as we have here. You might have, instead of the tapestry, two high windows with the drapery forming the background for your couch. You might have, on the other hand, a room in which there is a window right here and a window corresponding to it here. The couch between those two windows, and over the couch, in place of your tapestry—because you won't want to have a curtain on either side and tapestry in the middle—you might build up an effect of your photographs—your framed or unframed photographs—in a sort of a composition, a large one in the centre, building it up pretty high. Let there be one part of the room that reaches up as high as possible toward the ceiling—here we have it—you see how very well balanced the whole thing is, the two lamps on either side of the couch, a little table on either side, and the chairs, forming a feeling of composition which is just as much a composition as anything you can put into a painting or into a well-planned photograph.

The feeling of design is something which, when you recognise it, appeals very deeply to everybody.

Now I will move the table back into the middle of the room, and we will pile on it some more of these samples. We now have ample room for circulation around the table. We have some albums and photographs upon these tables because this room was meant for that purpose—to show those things—and we have them available on every occasion. We might have some on these little end tables, so that whoever sits upon the couch can have some of these things to look at.

Out here we will want a chair. Here is a little chair that doesn't really relate itself to anything in this room in point of colour,

but it does in point of construction; here you have the Jacobean type, which is so closely allied with the Italian type. I should like to have had a bench here, but we happen to have this chair, and because it does not fight very much with anything else in the room—rather harmonises, and gives a little touch of colour—I will leave it here.

Now we have a naked place—a wall space that probably would be utilised by a window. I feel very sure that no reception-room will have so few windows as I have here. I assume that on this wall we have a window, and a door, but I don't know it. I am not quite sure about it, but we could have a window there to fill that space. Inasmuch as I haven't, I want to show the use of a screen as a decoration in a room. We will put that in the corner. A screen can be made by hand at a very small cost, covered with moderately-priced tapestry or rep or cretonne, and used perhaps for mounting one or two photographs.

I want to talk about the lighting. First of all, in a living room I advise using a light which is rather quiet and specialised—coming from reading lamps here and there and there, and with not very much other light in the room. A reception-room has a different function. I saw yesterday in a photographic studio a lantern made out of clear parchment, right up close to the ceiling. The lights were in that, and they did not hit you in the eye, but they did give a general illumination for the room which was very good, and the lantern was very artistic and pleasing.

In a reception-room we want more or less general light. It is very hard to get it out of order. You can move a chair around wherever you want to, but that room remains in order. As soon as you have that group over there where it is, and this group and that group arranged as they are, this room will remain in order. There may be too many lamps. It is not necessary, of course, to have all these lamps.

I think there is a feeling of dignity—rather formal, but not too formal. The couch—the easy chair here add the feeling of comfort and usableness that takes away the formality of the arrangement.

In case of windows—and we haven't touched much upon them—the window in your reception-room as well as in your living-room offers a very large opportunity for decoration. You should establish the colour scheme. The draperies in the windows offer the largest space. Windows, by reason of their conspicuous placement, reaching up into the higher part of the wall, offer a great opportunity for establishing your colour scheme in your draperies.

If you have a very small room be sure that you have no large pieces of furniture in the middle of the room. Keep the space in the centre of the room absolutely free, if the room is small. If the room is small, have the draperies and your sash curtains harmonise almost in tone with the wall itself, because then you minimise the feeling of broken spaces.

If the room is small and low, have vertical lines as much as possible; if it is very high use horizontal lines. The two laws that I spoke of, of colour and arrangement, have been applied here. Arrange the furniture in groups—always in groups, never a miscellaneous piece here and another piece there. There is never any feeling of design or satisfaction about that. A table and a chair—get them together.

The two fundamentals, then, are suitability and simplicity. The simplicity is not in the minimising of the number of pieces, but grouping of them to get the feeling of design, and get them in such relationship that they can be absolutely adequately used together.

Ross Crane.

PHOTOGRAPHING EXHIBITION FOWLS.

[A writer in "American Photography" suggests that good business for photographers is to be obtained by photographing prize fowls. Photographs of these birds are always acceptable to the illustrated journals dealing with the breeding and exhibiting of the fowls, while for advertising purposes the breeders themselves become good customers to the photographer. Postcards of young "chicks" are sent to likely buyers, while catalogues, showing the types of the older birds, are issued by many of the breeders. It is, of course, necessary to have some expert knowledge of the special points of prize birds, and the author of these notes suggests that the photographer should study the winning birds at the various shows.]

The growing interest in the breeding and exhibition of standard bred poultry has opened up a field for the careful photographer to cultivate. Large sums of money have been paid for individual specimens, and the selling of these birds by the specialty breeder brings to the man with the best knowledge of advertising the greatest financial rewards. The customer is reached generally by the use of photographs of the birds, reproduced in poultry journals or circulars. The business is almost entirely a mail order one, and birds are shipped all over the world.

An accurate knowledge of the breed characteristics is essential, as each breed has a distinctive shape. The photographer should, therefore educate himself, by a study of the winning birds at the larger shows, so that he can distinguish these details. The best method of working is to prepare everything before touching the bird at all. Fix the spot on say the head of an upturned barrel, where the bird is to stand, and arrange the background to suit the colouring of the bird. This should offer a contrast to the actual plumage of the bird, as by this means a better rendering is obtained. Focus the head of the barrel or stand and set the shutter ready for exposure. Some birds are much more nervous than others, and therefore the less they are handled the less trouble you will have with them. A profile outline is usually what is required in this class of work, so the subject should be placed at right angles to the lens. A gentle massage of the bird's neck and between the wattles always seems to be appreciated, and by slowly drawing the index finger under and away from the beak the bird's attention can generally be held long enough to secure an exposure with the shutter set on "bulb." A quick pressure and release, probably about 1-5th second, will be found ample. This will give a negative which will make good prints on soft paper, which is the best kind to use to show feather detail. The "bulb" exposure allows more latitude if the bird is of a colour or combination of colours that requires a fairly long exposure. After a little practice you will be able to hold the bird's attention, so that it will be absolutely motionless during the exposure, and the bulb can be released at the least sign of movement. The bulb should have ample length of tubing to allow you to reach the bird with one hand, and, at the same time, to be out of the lens field. Considerable work may be done in the winter by the use of flashlight. The birds are placed on a box or table, and some kind of background improvised, depending on the colour of the bird. Bear in mind when selecting the background that the comb and wattles of most birds are red and will photograph very dark, so it is a good plan to pose the bird so that these appendages have a little lighter background to show them off to advantage. For flashlight work only a small amount of any of the standard makes of flash powders is needed, half a teaspoonful usually being sufficient when an aperture of *f* 8 is used.

When using flashlight, the birds may be placed directly on the object on which they are to be photographed and focussed by the aid of a dim light. Cap exposures are best for flashlight work, and with the bird in position the lens-cap may be removed and the flash let off. Negatives should be developed with pyro-soda, diluted in equal volume with water. The plumage of a male bird is more glossy than that of the female, and reflections should be avoided by a careful arrangement of the lighting. Do not expect to sell a breeder photographs of his birds unless you have studied the breed and know the points which should be emphasised. A breeder may point out to you the special features of the bird, but unless you know the precise moment to make the exposure to show the bird at its best, you will make very few sales.

A. R. P.

SAFEGUARDING OF INDUSTRIES ACT: GALLIC ACID.

The following is the Referee's decision in the gallic acid case, already reported in the "B.J." of October 6:—The complaint in this case is that gallic acid has been improperly excluded by the Board of Trade from the lists of articles dutiable under the Act. Gallic acid was originally included in the list. Complaint was made of this inclusion, and the Board of Trade took it out of the list in the belief that it was covered by something I said in the tartaric acid case. There was not any real contest at the hearing before me. None of these persons who might be interested in maintaining the exclusion of the substance from the list attended to take part in it. I am satisfied that the usual notices have been given, and that persons interested have had the usual opportunities of giving evidence and of taking part in the argument.

I regret that no one of them has availed himself of these.

On the evidence of Mr. Hill and Mr. Rose and of the chemical journals and catalogues that were put in I find that gallic acid has been and is regarded by the trade as a fine chemical. I think, therefore, that the original inclusion of the substance in the list was right and that its present exclusion is wrong. The reason for this exclusion is the supposition that in the tartaric acid case I defined a heavy chemical as a commercial product mainly used for industrial purposes. It is said that as gallic acid is a commercial product almost entirely used for industrial purposes therefore it is a heavy chemical. So far from laying down any definition in the tartaric acid case of the terms "heavy" and "fine," I expressly decided that there was no scientific or trade definition of the terms, and that therefore the test was the trade classification in each particular case. The view that I intended to express in the tartaric acid case was this: There was no definition of "heavy" or "fine," but that in ascertaining how any particular substance had been regarded by the trade one would probably find that the purpose to which the substance had been put had had a good deal to do with its classification, and that for the most part chemicals mainly used, and used to a substantial extent in industry, had been classified as "heavy."

I do not think that this applies to photographic chemicals. As to gallic acid the total quantity used in a year is comparatively small, and I find on the evidence that the trade has regarded it as a fine chemical. Applying therefore the same test as that applied in the tartaric acid case I come to the conclusion that gallic acid should be included in the list, and I so award. No costs.

Assistants' Notes.

Notes by and for assistants will be considered for this column. Payment for accepted contributions is made on the first of the month following publication.

Planning the Workroom.

THE modern tendency is towards labour-saving contrivances in the way of printing and enlarging apparatus, but there is much room for study in the way of arranging such gear in relation to position of sinks, towels, and switches, to mention only a few of the points that are touched in the regular passage of work through the various stages.

Time and money spent in the intelligent arrangement of details which have as their object the smoothing of difficulties and the saving of fatigue and inconvenience to the operative will always be found to be at least as profitable, regarded as investment, as the cash laid out for labour-saving apparatus.—D. C.

Fleck Markings on Glazed Prints.

A very objectionable defect of glazed prints is that when taken off from the glass the prints show small flecks or surface markings, caused by the surface being too hard. This is generally brought about by immersion in too strong a hardening bath, or too long in one of normal strength. This causes the gelatine to re-contract after it has been on the glass a short time. The defect can be seen if examined through the glass, although quite invisible at the time of placing prints on and squeegeing, etc.

Some papers do not require any after-treatment if the fixing bath contains a hardening agent, but can be put direct on to the glass from the last washing water. During the war I even found it necessary to place prints in lukewarm water previous to glazing, so as to ensure a good gloss.

Another cause of these markings is too much pressure applied at the time of squeegeing, a fact which has sometimes had to be carefully demonstrated before people are convinced, since there seems to be an impression that too much pressure is quite an impossibility. The same effect can be seen upon examination, as already stated above. These remarks equally apply to ferrotype plates.—W. H. C.

Railways and the Camera.

A TEST case decided that railway companies legally could make no charge for carrying a camera which a passenger took into his compartment as his personal luggage. It may be worthy of note, however, that in case of loss or damage the company could disclaim any responsibility, while if the outfit were carried as luggage in the appropriate van they would be liable for loss or damage in transit.

Most photographers avail themselves at one time or other of the cloak-room to leave apparatus overnight, and although I cannot remember such a case arising, it may be useful to point out that no railway company will accept responsibility for articles so deposited above a value stated on the ticket unless a special fee is paid.

The advantage of a really good lock on a camera case hardly needs pointing out, especially as it seems extremely rare to find anyone taking the trouble to declare the value while paying the small extra fee.—D. C.

Mixing Chemicals.

WHEN a winchester of solution is made up, the general practice is to dissolve the ingredients in part of the water and to fill up the bottle with plain water. A shake or two is given to the bottle and it is stood on the shelf for use.

It is seldom realised to what extent the strong solution originally made is heavier than the added water. When juniors are entrusted with making up developers great stress should be laid on this, as many a seeming variation in output has been traced to neglect in thorough mixing of newly-made solutions.

If a bottle that has been made up a little while be inverted and held against the light, the intermixing liquids can be plainly seen. The violent shaking up and down so often employed is waste of effort because ineffective. The bottle requires turning upside down and back again steadily with a distinct pause of a second or two between each motion. Apparently slower, the result of a perfectly homogeneous mixture is attained in about twenty seconds.—D. C.

Exhibitions.

ROTHERHAM PHOTOGRAPHIC SOCIETY.

THE 33rd annual exhibition of the Rotherham Photographic Society was held last week, and was opened by Mr. T. W. Grundy, M.P. The president, Mr. H. C. Hemmingway, in a short address, said that having knowledge of the whole series, he could proudly say it was the best. To exhibit their own work might be regarded as egotistical, but here was a healthy rivalry engendered, and an encouragement to do better. They had confidence in believing that their yearly efforts had been of educational value, and filled one of the gaps in the social life of the town. The Society was affiliated to the Royal Photographic Society, and they were justly proud of the success of one of their members, Mr. Ralph Chislett, in his winning the blue ribbon of that organisation in one of the sections of nature work. The Rotary Club had extended a brotherly hand towards their modest venture, and it was possible that when the Club's survey scheme got going it might find a use for the Society's talents.

The following awards were made in the open section:—Class A (Landscape, etc.): Silvered plaque: "A Derbyshire Village," W. H. Hadley, Manchester. Hon. mention: "Old Whitby," E. Tinker, Sheffield, and "Peaceful Pastures," C. J. Unsworth, Didsbury.

Class B (Portraits, etc.).—Plaque: "Head Study," Sydney H. Wood, Darlington. Hon. mention: "Peggy," Ralph Jones, St. Anne's-on-Sea.

Class C (Architecture).—Plaque: "An Old World Corner," W. Bailey, Leicester.

Class D (Natural History).—Silvered Plaque: "Photo-Micrographs of Eggs of British Butterflies." Alfred E. Tonge, Reigate. Plaquea: "Lions." W. H Hadley, Manchester, and "Long-eared Owl at Nest," T. M. Fowler, Wombwell. Hon. Mention: "Woodcock," J. A. Sharpe, Lewes; "Arctic Skua Alighting," Ralph Chislett, Rotherham; "Herring Gull," Tom Taylor, Oldham; and "Garden Warblers," Thos. Robinson, Clitheroe.

Class E (Still Life).—Plaque: "Wendy," H. W. Howe, Harrow-on-the-Hill. Hon Mention: "Japanese Peonies," F. G. Tutton, Exeter.

Class F (Lantern Slides, Monochrome).—Plaque: "Gannett and Young," T. M. Fowler, Wombwell. Silvered Plaque: "Old Pewter," Ranald Rigby, St. Anne's-on-Sea. Hon. Mention: "Caterpillars of Moths," C. W. Colthrup, E. Dulwich; "Morning Mist in Lakeland," Victor E. Morris, E. Grinstead; "Gossamer—Spider's Web," A. S. Pye, Rotherham; "White Currants," A. S. Pye, Rotherham; and "A Careful Crossing," Ernest Tinker, Sheffield.

Class G (Lantern Slides, Colour).—Plaque: "Silver Birches," Walter Scruton, Leeds. Hon. Mention: "Fruit Study," J. W. Davies, Sheffield.

FORTHCOMING EXHIBITIONS.

October 18 to 28.—Portsmouth Camera Club. Particulars from the Hon. Secretary, C. C. Davies, 25, Stubbington Avenue, North End, Portsmouth.

November 4 to 11.—Bournemouth Camera Club. Particulars from the Hon. Secretary, 88, Old Christchurch Road, Bournemouth.

December 9 to 31.—Rochdale Amateur Photographic Society. Particulars from the Hon. Secretary, W. Lord, 10, Derwent Street, Rochdale.

1923.

February 5 to March 3.—Northern Photographic Exhibition, City Art Gallery, Manchester. Latest date for entries, January 12. Particulars from the Hon. Exhibition Secretary, Walter Johnson, 30, Hartington Road, Chorlton-cum-Hardy, Manchester.

March 2 to 31.—Pittsburgh Salon of Photography. Latest date, February 5. Secretary, Charles K. Archer, 1,412, Carnegie Building, Pittsburgh, Pa., U.S.A.

March 13 to 16.—Exeter and West of England Photographic Exhibition. Particulars from the Hon. Secretary, Frederic G. Tutton, 9, Union Road, Pennsylvania, Exeter.

March 15 to 24.—Photographic Fair, Holland Park Hall. Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1.

March 1 to 8.—Birmingham Photographic Society. Latest date for entries, February 15. Particulars from the Hon. Secretary, J. E. Breeze, 178, Broad Street, Birmingham

Fashion Photographs.—A costumier's advertisement in the "New York Times" has as an illustration a triple photograph of a type once popular in England. The fashionably-clad damsel is posed against a triple full-length mirror, the photograph showing the model herself and three reflections, the mirrors being at different angles; the back, side and front of the costume are shown in the one picture. This plan might be revived by some of the present-day London photographers of costumes.

British Industries Fair.—The Board of Trade have commenced their publicity work amongst probable buyers from overseas, by the first of a series of letters, giving particulars of the many features of the forthcoming Fair, to be held from February 19 to March 2, 1923. A general illustrated booklet is being published in nine languages, and this will also be distributed throughout the world. The Fair will be held concurrently at London and Birmingham, the latter covering machinery, general hardware, etc., while in London, at the White City, the lighter manufactures (in which optical, photographic and cinematographic goods are included) will be shown. The spaces applied for are now being allocated. Any manufacturer who has not sent in his form should immediately communicate with the Secretary at 35, Old Queen Street, London, S.W.1.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications October 9 to 14:—

Apparatus.—No. 27,697. Projecting and photographic apparatus. V. Bridgman and S. Ormea.

Apparatus.—No. 27,924. Photographic and cinematographic cameras. S. Sullivan.

Apparatus.—No. 27,816. Photographic apparatus. H. B. Stringer.

Development.—No. 27,645. Photographic developing tank. G. F. Framjee and A. Waterworth.

Flashlight.—No. 27,733. Flashlight apparatus for photography. W. S. Crapper and B. M. Hillier.

Shutter.—No. 27,960. Photographic shutter with movable screen. Compagnie Aerienne Francaise.

Processes.—No. 27,590. Photographic processes. A. L. and M. Landau.

Processes.—No. 27,333. Photographic processes. Wadsworth Watch Case Co.

Cinematography.—No. 27,334. Production of cinematograph films, etc. E. C. R. Marks (Daylight Film Corporation).

Cinematography.—Nos. 27,923 and 27,925. Cinematographic apparatus. S. Sullivan.

Colour Cinematography. No. 27,308. Colour cinematography. D. C. L. Syndicate, Ltd., and F. W. Donisthorpe.

Colour Cinematography.—No. 27,953. Projector lanterns and slides therefor and means for producing animated pictorial effects in colour Kinemas, Ltd.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

Photographic Type-Composing Machines.—No. 186,255. (September 29, 1921.) The invention relates to a printer's composing machine, for photographically producing a negative of the printing surface for lithographic, offset, letterpress and photogravure printing. Matrices of either a negative or positive character are employed dependent upon the type of printing in view, and a type-setting machine, with the usual magazine, keyboard and distributor. A camera attachment is provided for photographing step by step the various lines, or portions of lines, when set. The complete block of matter is conveyed photographically by means of a beam of light passing through or from the matrix, and through a lens on to a sensitised plate or film. The negative obtained is employed in the usual way for preparing the printing surface for reproduction. The invention may be broadly summarised as a type setting machine similar to the well-known "Linotype," but the usual type-casting matrices are replaced by characters, suitable for reproduction by photography. In carrying out the invention means are provided for justifying a line, photographically by enlarging or reducing, to bring it to the required length. In conjunction with the automatic focussing is a centralising mechanism which shifts the camera lens laterally to compensate for displacement of centre in case of a long or short line. The guideway carrying the matrices to be photographed is formed with a movable part, so that each line, when set by the operator, may be automatically raised to photographic position in front of the lens. Various mechanical movements are provided for automatically raising a set line, justifying, exposing and moving the sensitised surface step by step, but these are capable of modification within the limits of the invention. It is proposed to employ transparent or translucent matrices of glass or equivalent, either negative or positive. These may be constructed of two superimposed plates of ground glass, the character being on an abutting face and the plates bound together at the bottom by a suitable metal binding. At the top the plates are mounted in a metal head, which may be cut with a distri-

buting combination similar to the combination used in the matrices of the well-known linotype machine. Alternatively, the matrices may be of metal bearing a black letter on a white ground or a white letter on a black ground. The slideway is fixed on a transverse vertical wall erected on the base of the machine. As each line of matrices is complete, it is moved to a central movable part of the slideway, and is raised in register with the shuttered opening of a photographic camera. Each line of type is photographed as it is positioned, by the automatic operation of the shutter on the lens working in conjuction with the movements of the slideway. A Bowden cable communicates from the shutter of the lens to a suitable position, terminating in means for synchronous actuation according to the cycle of the machine. After exposure, the line of matrices is moved along the slideway away from the central position for distribution to the magazine in the usual manner.

Any suitable light may be employed, the light being projected through the translucent matrices or on to the front faces of the opaque matrices, and thence through the lens. An arc lamp is placed in a suitable position, and its beam is projected directly through the matrix line or via any suitable mirror or prism system for reflecting the light. It then passes through the shutter to the lens of the camera. The shutter is regulated by a micrometer adjustment so that the requisite width of light strips are impressed on the sensitised plate or film. This adjustment is in accordance with the required line spacing, and the vertical travel of the plate or film line by line also works in accordance with the required spacing.

A photographic camera for use in combination with the foregoing consists of a vertical partition mounted on the base of the machine parallel to the shuttered aperture. This partition is constructed with a focussing jacket carrying a suitable lens. The partition is connected to the walls of the shuttered aperture by means of a light-tight bellows, and is capable of adjustment between the opening and a plate or film carrier. The rear of the machine may be built into a dark-room. In the rear of the partition is mounted the carrier for a glass plate, roll film, or sensitive transfer paper. The carrier supports are movable along the base, and the carrier is provided with a finer longitudinal adjustment working in conjunction with a justifying device. It may also be furnished with a micrometer screw adjustment to alter the position of the camera for correcting focus. The upper and lower frames are adjusted to take any size of plate within wide limits, and, by aid of racks, the plate is capable of vertical and horizontal movements for columns and other comparatively large initial adjustments. The plate carrier frame is suspended in suitable guides by a pair of cables running over pulleys on the main supports, there being counterweights so that the plate may be lowered by a ratchet movement line by line synchronously with each set line of matrices and photographic exposure. Suitable automatic mechanism to effect the periodic movement of the plate may also be employed.

A gearing is used to effect the proportionate movement of the supports carrying the adjustable lens partition and the negative supports together, so that various sizes of matrix image may be projected in accordance with a predetermined scale of enlargement or reduction of the matrix characters. Such movement is made and the members positioned as a preliminary to type-setting by the operator. A suitable indicator at or near the keyboard indicates the relative size of the images at various positions of the members.

The justifying and centralising movements work in conjunction with the rise and fall of the guideway. A cam withdraws a justifying plunger until the guideway has attained the high position. Through a quadrant the plunger is returned and presses against the end character in the line of matrices resting in the guideway under the influence of a spring. If the line is of normal length, the position of the plunger is such that an arm comes to rest in a position having no effect on the focus of the camera. But if the line of matrices is wider than normal the displacement of the plunger is communicated through the quadrant and arm to a cross rod. The latter has a cam device on an inclined runway which causes the bar to move toward the front plane of the machine. This moves two rods which are adapted to adjust the two carriers each its respective distance, and so alter the focus as to reduce the photographed image of the line to the normal length.

To centralise a reduced line the lens may be laterally moved according to the position of an arm. To accomplish this a connecting link oscillates through a pin and lever. The latter in turn partially rotates the shaft, and by a pinion moves a racked arm extending from the lens jacket. The pinion is keyed to the shaft, and travels along the same with the carrier. In the case of underwidth lines, a plunger moves beyond its normal position, and the arm again transmits the displacement from normal to the cross rod, causing a bar to be moved away from the front plane of the machine. Alternatively, a mechanical method of justifying short lines in type-setting machines may be employed by using wedges, which fit into the spaces of the composed line to the requisite amount, and expand the line as a whole to the normal width. Such a form is suitable for use with transparent matrices to engage the upper ends, and so permit light to pass between the words. With matrices of a negative character, a double-wedge space band is required to block out the light between the words, and with opaque matrices a double wedge spacer would be used, having its edge black or white, according to the blackground of the matrices. John Robertson, Thomas William Brown, and Andrew Orrell, St. Leonard's Road, St. Anne's-on-the-Sea.

The following complete specifications are open to public inspection before acceptance :—

LENS.—No. 186,917. Photographic lens. Ernemann-Werke Akt.-Ges.

CINEMATOGRAPHY.—No. 186,898. Apparatus for producing cinematographic pictures with relief effect. C. Parolini.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, OCTOBER 30.

Birmingham Phot. Art Club. "The Man behind the Camera." C. P. Crowther.
Bradford Photographic Society. "Oil Printing." H. Bradley.
Dewsbury Photographic Society. Y. P. U. Shield Portfolio.
Kidderminster and District P. S. "Bruges and Rothenburg Compared." E. A. Bierman.
Southampton C.C. "Home Photography." A. Dordan Pyke.
Wallasey Amateur P.S. "Sanderson Cameras." Messrs Houghtons, Ltd.
Willesden P.S. "Cameras and their Uses." W. Angold.

TUESDAY, OCTOBER 31.

Royal Photographic Society. "Past and Present Methods of Making Photographic Lenses." W. B. Appleton.
Birmingham Phot Soc. "A Trip to Paris." A. Brooker.
Bournemouth Camera Club. Lecturettes.
Exeter Camera Club. Members' Print Criticism evening.
Hackney Phot. Soc. Easter Holiday Lantern Lectures.
Halifax Scientific Society. "Photography and its Application." J. Halliday.
Leeds Phot. Soc. "With Allenby in Palestine." Rev. H. Motley.
Maidstone and District Phot. Soc. "A. P. and P." Prize Prints.
Manchester Amateur P.S. Lantern Lecturettes.
Morley Amateur P.S. Lantern Lecture. A. Nevin.
Portsmouth Camera Club. "Carbro." A. Dordan Pyke.
Slough and District Y.M.C.A. Phot. Club. "Character in Portraiture." R. H. Chennell.
Sooth Glasgow Camera Club. Lecturettes.

WEDNESDAY, NOVEMBER 1.

Croydon C.C. "Biarritz to Carcassone." Dr. C. A. Atkin Swan.
Birkenhead P.A. "Modern Negative Making." M. B. Fleming.
Bristol Photographic Club. Negative Making. By Members.
Edinburgh P.S. "My Fifty Best Photographs." Rev. H. N. Bonar.
Partick C.C. "A Tour in a Caravan." J. G. Mossemeneer.
Rochdale P.S. Gaslight Printing Demonstration. A. Lee.
South Glasgow C.C. (November 1-11). Exhibition of Work by L. Misonne.
South Suburban and Catford Phot. Soc. "Some Southern Counties of Olde England, as seen through the Camera." H. E. West.

THURSDAY, NOVEMBER 2.

Coatbridge Phot. Assoc. Members' Night.
Hammersmith Hampshire House P.S. "In Neptune's Kingdom." F. Martin Duncan.
Letchworth Camera Club. "Carbon." A. E. Bowyer-Lowe.
North Middlesex P.S. Outings Prints and Slides; Members' Queries.
Richmond Camera Club. "Carbro." A. C. Braham.

SATURDAY, NOVEMBER 4.

Bournemouth Camera Club. Annual Exhibition.
Cambridge and District Photographic Club. "The Principles of the East Anglian School of Landscape Photography." E. Peake.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A meeting of the council was held at 35, Russell Square, London, on Friday, October 13, 1922. Present:—

Messrs. Marcus Adams, Angus Basil, Arthur Bennett, Frank Brown, W. B. Chaplin, A. H. LL. Chapman, Gordon Chase, T. Chidley, Alexander Corbett, C. F. Dickinson, W. E. Gray, Reginald Haines, George Hana, Herbert Lambert, H. A. St. George, R. N. Speaight, H. C. Spink, F. G. Wakefield, A. Swan Watson, W. H. O. Wedlake, H. D. Halksworth Wheeler, and the Secretary (Alfred Ellis). Mr Alexander Corbett in the chair.

Mr. Speaight proposed, and the reception of the proposal by the council was so hearty that there was no need for a seconder, that Mr. Corbett, the new president, continue to act as chairman of council for the ensuing year. This was agreed to unanimously. With the same unanimity Mr. Alfred Ellis was reappointed secretary.

The secretary reported the receipt of a letter from Mr. W. Illingworth, bearing the date October 12, confirming his decision, expressed verbally at the meeting of September 15, to retire from the council. The resignation was accepted, with expressions of regret and of appreciation for Mr. Illingworth's past services.

The vacancy thereby created on the council was considered, and it was proposed by Mr. Chidley and seconded by Mr. Wheeler that the Society of Master Photographers (Lancashire and district) be asked to nominate someone who was a member of the Association who would be willing to serve.

Mr. Speaight reported that there was a balance on current account of £33 13s., and on congress account of £30 12s. 11d.

A discussion took place on the subject of the next congress, and suggestions were made with regard to the suitability of different seasons, and the claims of a spring as against an autumn meeting. The feasibility of holding the congress in a provincial town was also discussed, as well as the possibility of holding a modified spring congress next year without an exhibition. The chairman suggested that a small committee be appointed to go into the whole matter and report to the council. The committee was appointed to consist of the following:—

Messrs. Adams, Basil, Chase, Haines, and Wakefield, and the chairman and treasurer *ex officio*.

Mr. Speaight presented accounts for the "Record," and Mr. Watson commented on the great amount of work the "Record" committee had accomplished. He quoted golden opinions which he had heard as to the excellency of the publication. He proposed and Mr. Frank Brown seconded that £100 be voted to the "Record" as a working capital. This was agreed to.

Mr. Hana brought forward the question of advertisements of German goods, and read three letters thereon. It was resolved on the proposition of Mr. Gordon Chase that he continue to act in accordance with the resolution passed on June 20, that all applications for advertisement space be considered on their merits.

Mr. Hana presented a list of commercial prices, and it was agreed that the same should be published in the "Record," and that they be copyrighted, but that permission for their reproduction be granted at the discretion of the council.

Mr. Wakefield reported on correspondence with the Empire Exhibition authorities, from which it appeared that the present holder of the photographic rights had them for one year only on a payment of 10 per cent. commission and a guarantee of £500. The question of the two guinea fee demanded for permission to photograph was to be taken up by the Manufacturers' and Dealers' Associations, and it was suggested that the P.P.A. should work in conjunction with them to protest against the unreasonableness of the terms of the monopoly. It was resolved that the secretary, with Mr. Wakefield, should interview Messrs. Houghtons, Ltd., on the subject.

The secretary also reported that no advance had been made with the Press Photographers' Association on the question of the action of art editors in taking single figures out of groups.

With reference to a letter from Mr. Tirrell, of Elgin, on the question of excluding photographers on a royal visit, a member said that the authority for such exclusion was generally given to the police, and the secretary was instructed to communicate with the police at Elgin on the subject.

Mr. Chase brought forward a simplified co-operative advertising scheme, which would consist in having display cards printed for placing in photographers' windows.

The chairman pointed out that this was not the scheme of co-operative advertising proper which they had to consider. The secretary read a letter from Mr. Beaufort, of Elliott & Fry, who suggested that any scheme should be in the hands of experts working in conjunction with photographers, who should be asked to send in their suggestions. Mr. Lambert moved and Mr. Adams seconded that the whole subject be adjourned to the next meeting, and this was agreed to.

The secretary read the names of sixty applicants for membership received since the last ordinary council meeting, and these were approved. The resignation of Mr. F. J. Arnott, of Lymington, was accepted, he having sold his business.

The council having sat for four hours, it was decided to adjourn the meeting until Thursday, October 19, at 6 p.m., when the London members promised to attend to consider the secretary's correspondence, which it had not been possible to take.

CROYDON CAMERA CLUB.

Mr. J. C. Coffin was announced to lecture on "A Dark-room Under the Tiles." Without wishing to belittle his, no doubt, independent discovery that this position is preferable to a location above the tiles, yet, unfortunately, he cannot claim to be the first and true inventor.

Apart from a recent discourse on "Duralumin," he has trod the boards but seldom, preferring the pleasing role of a general disturber of the peace. Let a fellow-member, whilst lecturing, apparently fall into error, and a smile of substantial elongation instantly adorns Mr. Coffin's face, only to come off at the first chance of getting home a real Mary Ann punch. This does not always land, and occasionally Mr Coffin has experienced being converted into an exceedingly appropriate container for himself.

The dark room transpired to be immediately under the tiles approached by a ladder, a position rendered compulsory after ejectment from a spare room owing to an addition to the family. Few would have the skill to erect such a well-appointed celestial apartment, but all listened with attention to full constructional details, supplemented with elaborate working drawings and many diagrams on the blackboard. He believes in comfort, and blow the expense, a Brussels carpet being on the floor to ease the feet, and thick felt on the solitary chair to soften impact. Even the sink is lined with rubber so that dishes and graduates can take things easily. Electric light, and a water supply and outlet, which viâ the gutter once gave a neighbour an unexpected and medicated cold bath, complete the equipment. No wonder the president, in proposing a vote of thanks, paid the lecturer a delicate compliment by saying that he confidently looked forward to far and away better work from him in the future. Mr Keane is always confidently looking forward to something or other in the desirable line, and if a kind friend would present him with a respectable pipe in place of his latest (apparently purchased from Woolworth's at ruling prices), it would be conferring a favour on those compelled to sit in the vicinity of the president's chair.

Prior to the start Mr. E. A. Salt, by kind permission of Mr. Coffin, made reference to a past observation of Mr. Jobling, that very full correction was obtainable on ortho' plates of the self-screened class, with filters of low multiplying factor, and showed a comparative and instructive test.

An exposure was made on an Imperial "Non-filter" plate without a filter, and another prolonged five times with a Wratten K 1½ filter in position. Both negatives were developed in the same dish for the same time to a degree of contrast about right for platinotype, and were printed for the same time. The prints handed round showed approximately the same printing value as regards general depth.

In the print from the first negative the foliage was nicely rendered and the tone representing a cloudless blue sky appeared to be fairly true. A church spire, of somewhat light hue inclining to yellow, was depicted as a dark object against the sky. In the print from the second negative the spire appeared as a white object against the tone of the sky, which was but slightly darker than its counterpart. The foliage here showed much lighter, and from his recollection of the scene appeared to be over-corrected. If so, a "correct" rendering might have caused the almost shadowless front bit spire to vanish altogether.

He also alluded to the non-halative properties of the new D.S. backing, which was liberally applied, and which, from trials made on the "Eclipse" ultra-rapid plates, he had found to be highly efficient. Many would remember that the letters "D. S." comprised the initials of a self-christened Mr. Windle, who years ago achieved notoriety in banking, and subsequently in legal circles, but he understood there was no connection between Mr. Windle

and the backing. Unlike some of its tribe, it appeared to be of a stay-at home character even when bumped about in metal slides, a very strong point in its favour. During the late stages of development it also permitted of inspection of the negative by candle light. Except in an emergency he regarded this procedure as a fatuous stunt, for a bright yellow safe-light in the dark-lamp obviously afforded far and away more light, with no risk of fog. At the earnest request of the president Mr. Salt then subsided.

Commercial & Legal Intelligence.

LEGAL NOTICES.—Notice is given of the dissolution of partnership of Wilfred Dennis Moss and Edwin Charles Peckham, trading as Moss, Dennis & Peckham, at King Street, Stroud, as photographic artists. Debts will be paid by E. C. Peckham.

NEW COMPANIES.

SCIENTIFIC OPTICAL SOCIETY, LTD.—This private company was registered on October 10 with a capital of £2,000 in £1 shares. Object: To carry on the business of opticians, manufacturers of and dealers in optical, mathematical, philosophical and photographic instruments, etc. The subscribers (each with one share) are:—W. H. Hawkins, 5, Medina Terrace, Hove, Sussex, director; E. J. Evershed, Thanet House, 231, Strand, W.C.2, solicitor; W. H. Hawkins is managing director. Qualification, 50 shares. Registered office: Thanet House, 231, Strand, London, W.C.

FRANK LESLIE (CHEMISTS), LTD.—This private company was registered on October 17 with a capital of £3,000 in £1 shares (2,000 6 per cent. cumulative preference and 1,000 ordinary). Objects: To adopt an agreement with F. Leslie, and to carry on the business of chemists, sundrymen, dealers in photographic, fancy, and scientific goods and instruments, perfumery and toilet goods, etc. The first directors are:—F. Leslie, 119, Ardgowan Road, Catford (managing director); Mrs. M. Leslie, 119, Ardgowan Road, Catford; T. G. Usher, 22, Merchiston Road, Catford. Qualification, £100. Remuneration, as fixed by the company. Registered office: 118, Rushey Green, Catford.

News and Notes.

THE LATE MRS. WALTER SCOTT.—We are sorry to hear of the death, after a very short illness, of Mrs. Walter Scott, wife of Mr. Walter Scott, of North Parade Studios, Bradford. Mrs. Scott took a very active part in her husband's business for many years, until failing health compelled her to resign these duties some three years ago.

THORNTON-PICKARD ENLARGERS.—A circular descriptive of their latest models of enlarging lantern has just been issued by the Thornton-Pickard Manufacturing Co., Altrincham. It describes a new pattern of enlarger, the "Imperial," issued in four sizes from quarter-plate to half-plate at prices (without lens) from £5 5s. to £8 17s. 6d. The list is obtainable free on application.

MR. EDGAR CLIFTON, whose wide experience of studio and other departments of the photographic portrait business is no doubt well known to many of our readers, informs us that he is now at liberty to undertake advisory work for photographers, such as the improvement of daylight studios, fitting up of artificial light installations, planning of workrooms, etc. Mr. Clifton may be addressed at 27, Hanley Road, Stroud Green, London, N.4.

MR. THOMAS ILLINGWORTH, after a business career of over thirty years, has resigned the managing directorship of Messrs. Thomas Illingworth and Co., Ltd., in which office he will be succeeded by his son, Mr. Thomas Midgley Illingworth. The well-known Willesden firm will, however, have the advantage of Mr. Illingworth senior's wide experience of the business, since he will remain on the board in the capacity of consultant director. We wish Mr. Illingworth every happiness in the greater leisure which his partial retirement from active duties will bring to him.

PHOTOGRAPHIC SURVEY OF BRISTOL.—At the annual meeting of the Bristol and West of England Amateur Photographers' Association, a resolution was passed in favour of making a more systematic and extensive survey and record of the city and its immediate environment. One of the arguments adduced in favour of the decision was that in a city of such proportions there were many architectural and geographical features that disappeared from time to time, and a photographic record of them would be of use, as well as of interest in the future. Mr. C. F. W. Denning, F.R.I.B.A., undertook the duties of secretary of the architectural section, and Mr. F. Beames, B.Sc., consented to act in a similar capacity for the geographical section.

PRICES FOR COMMERCIAL PHOTOGRAPHY.—The Professional Photographers' Association has no desire, indeed it does not consider it its duty, to control prices. There has been, however, a continued demand for knowing what are considered to be fair and reasonable prices for commercial photography. To satisfy this desire, a questionnaire was drawn up by Mr. George Hana, and hundreds distributed amongst photographers who did commercial work. The returns, which were beyond anticipation, have been collated and analysed by Mr. Hana and Mr. Jenkyn Griffiths, whose findings will be published in the November issue of the "P.P.A. Record." Average prices have been arrived at, and the professional photographer can adjust his prices accordingly. Copies of this issue of the "Record" are 9d., post free, from 36, Warwick Road, Earl's Court, S.W.5.

WALLACE HEATON AUTUMN SALE.—Messrs. Wallace Heaton, Ltd., 84, High Street, Sheffield, send us the 56-page price list of the autumn sale of photographic apparatus which they are now holding. Stocks of all descriptions of goods, cameras and lenses, have been further reduced in price, and include the stocks recently purchased from two well-known dealers. Messrs. Wallace Heaton specially point out the almost pre-war prices of their Zodel enlarger. It is now supplied in quarter-plate size at £5 10s. and in half-plate size at £9, in both cases inclusive of Petzval portrait lens. Since the list was issued Messrs. Wallace Heaton have further purchased the stock of a London and provincial dealer, and are offering goods, running into some thousands of pounds, at exceptionally low prices. These include in particular hand cameras of all kinds. It is evident that the intending purchaser of apparatus has in this sale the opportunity of buying one or other of the latest models of camera at a very advantageous price. The list is sent free on application.

OVER-ENTERPRISING PRESS PHOTOGRAPHERS.—Many of the newspapers last week contained a portrait of Dr. B. Hartzhorne, who is in the Royal Free Hospital suffering from sulphonal poisoning. The victim was pictured lying insensible in the hospital bed. The photograph has been severely criticised by the public, and its appearance is not likely to improve the position of photographers who work for the Press. A statement has been issued by the hospital, through the Commissioner of Police, with reference to the photographs, as follows:—"Two men, purporting to be Press representatives, obtained access to the hospital on the ground that they had received permission from Scotland Yard to photograph the patient. This statement was queried by members of the governing body of the hospital who happened to be present, whereupon the men gave up certain photographic plates which they had taken, reassuring these gentlemen emphatically that these were all the plates they possessed. They were then allowed to depart. On inquiry at Scotland Yard it has been ascertained that the statement made by these men was wholly untrue. The hospital authorities have always realised the necessity for securing the absolute privacy of the inmates, and regard the intrusion of these men as a disgraceful act."

PHOTO-MICROGRAPHY.—The sixth edition of the booklet bearing this name, and described "as an introduction to photography with the microscope," has just been published by the Wratten Division of Messrs. Kodak, Ltd., Kingsway, London, W.C. To the beginner in this interesting branch of photography, a volume, containing such a wealth of information, and covering all sections of the work, will be most useful, and should prove a great help in overcoming any difficulties that are likely to be experienced. The apparatus used in photo-micrography is fully described, and some interesting notes are given upon the light-source and the selection of a suitable illuminant. The obtaining of the necessary contrast when producing photographs of slides of lightly stained sections is fully explained, and illustrations are given to show the value of light-filters for contrast and detail. Some notes are included upon the Rheinberg system of differential colour illumination, a set of stops now being available for the process. The concluding chapter deals with photographic procedure, exposure and development being fully explained and formulæ given for the

various solutions. The volume forms a useful adjunct to the library of the photographic microscopist, and we are pleased to recommend it to all who are interested in this direction. The price of the booklet is 6d.

THE STORY OF A FAMOUS PHOTOGRAPHER.—The October edition of the American magazine contains the report of an interview with Mr. Pirie MacDonald, of New York. This well known photographer, whose subjects are amongst the best known men of the industrial and social world, gives some interesting incidents of his career. His first attachment to photography was as an assistant at four dollars a week, and his duties included all the dark-room work and the outdoor photography. For this liberal sum he also "took all the orders, kept the books, helped to make the frames, and bought the Christmas cards." In seven years he had saved fifty dollars, and with this as his capital he decided to rent a studio of his own. After many trials he managed to make his mark in the photographic world, and to quote his own words, "became an infant prodigy." He was in those days famed for his photographs of the fairer sex, and it was not until the year 1900 that he decided to please himself and devote his attention to the photography of men. "It is not sufficient to be, in technique, the most expert photographer in the world," Mr. MacDonald told his interviewer, "you must be able to make a portrait that will satisfy the people for whom it is intended. To do that you must give them something more than merely the outside of the face; you must give them the inner personality, and it must be the special phase of personality that is wanted in that particular picture."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

SOFT-FOCUS COMMERCIAL PHOTOGRAPHS.

To the Editors.

Gentlemen,—In your note on soft-focus commercial work, in the issue of the 20th inst., you remark that it is a difficult matter to work up prints in the customary manner when a soft-focus lens has been used.

May I point out that in America, where a large amount of soft-focus advertisement illustrating is done, it is the custom with, I believe, the majority of workers to make the original print with an ordinary anastigmat lens, then to work this print up as may be thought necessary, with lettering etc., included. A copy of this worked-up print is then made with a soft-focus lens, and a final print, which is entirely photographic, is put into the hands of the block-maker. Thus the very real difficulty of which you spoke is overcome.—Yours faithfully,

STUART BLACK, B.A.

1, Cary Place, Fleet Street Torquay, October 21.

DARK-ROOM LIGHT FOR BROMIDE PAPER

To the Editors.

Gentlemen,—A dark room worker of any experience worth having would vote a red light to be quite safe for any development paper, for which a yellow or orange light is advised. Many workers, however, fearing the unsafeness of a yellow light for bromide paper, do not hesitate to use a red one, and yet no maker of bromide paper ever recommends the use of a red light! For generations a yellow light has been advised for bromide papers, even for the most rapid makes. To those accustomed to the dim red light of the plate-developing room a yellow light may appear to be too "light," and fears of fogging may be entertained. If, however, fogging does occur, it will be because of exposing the paper to the yellow rays for too long a time, or, of course, to the admission of white light.

The point I wish to emphasise is that for bromide paper yellow light is very much safer than red, and it needs but a few trials to prove it. I scorned the idea when I first heard it, believing my informant to have "a bee in his bonnet," but the continual and mysterious fogging of a particular make of bromide paper led me to experiment. I then discovered that the paper fogged much more quickly in a red light than in one of the orthodox yellow. I had given up a yellow light in favour of a red because the high lights in my enlargements did not appear as clean as I liked them to be, but the red light gave me no better results. So sensitive to red was one brand of bromide paper during last spring that it was possible to get an enlargement through the ruby cap of the enlarging lens and within a reasonable time. Such being the case, one will realise how quickly the paper fogged when it was developed near to the red lamp of the dark-room. The same paper did not fog nearly so quickly when exposed to a fairly bright yellow light, while with two thicknesses of fabric in the dark room lamp fogging was quite unnoticeable.

So much attention has been given to the preparation of red and green "safe lights" for use with plates that the yellow one for bromide papers appears to have been neglected. With the extra-sensitive bromide papers now on the market it is a pity some enterprising dealer has not made a specialty of an extra "safe" yellow medium. It is when a yellow light is suspected that a worker is induced to "turn on" the red, and not always with the most satisfactory results.

All bromide papers have not this peculiar red-sensitiveness. One batch of paper, it appears, may have it, while the next batch may not. It is something that cannot always be relied upon, hence the care necessary when starting work with a new batch and the importance of keeping to a yellow light.

HYPERION.

BEHAVIOUR IN THE STUDIO.

To the Editors.

Gentlemen,—I always enjoy reading Mr. J. Effel's lively contributions, and agree with much that he has said, but I think he rather overstepped the mark in his contribution (on page 631) last week. He is too severe on the rank and file of studio workers.

I am not a professional photographer, but rather a looker-on, and as such can claim to see most of the game. I have called upon and sat to photographers ranging from the really third-rate man (who is to be found in the lower quarters of our great industrial centres) to the very best West End photographer, and I have never yet met an operator so woefully ignorant as he imagines the tribe to be.

Your correspondent italicises the story of sending a lady upstairs and the operator following, and I am not so sure that your correspondent's plan of going first is the correct one. The procedure, in my humble opinion, should depend upon the architectural construction of the place. Still, I know of some studios in which it is possible to get lost in a journey from the reception- or dressing room to the studio proper.—Yours faithfully,

M. P. P. A.

IRIS AND WATERHOUSE DIAPHRAGMS.

To the Editors.

Gentlemen,—With reference to the invention of the iris and Waterhouse diaphragms, attention may be called to statements made many years ago by Traill Taylor. Mr. Traill Taylor named Lake Price as being the real inventor of the "Waterhouse" diaphragm, Waterhouse making some improvements. It may also be mentioned that the latter worker was called "Dr." Waterhouse by Mr. Taylor.—Yours faithfully,

A. MANSFIELD.

THE 1923 P.P.A. CONGRESS.

To the Editors.

Gentlemen, I am pretty much in agreement with Mr. J. Speight, but think now that the matter has been brought prominently before photographers, it would be better for all who are interested in the subject to write to the Council and continue the discussion in the official "Record." The subject is hardly one that concerns amateurs or those photographers who refrain from joining the P.P.A., but it should concern the existing members very considerably. Country members must, of course, bear in mind that they alone could not run the P.P.A. without the London help, and the London men may equally bear in mind that though they can no doubt organise a successful exhibition of portraits without *much* assistance from country members of the P.P.A., yet without the country subscribers the Conference and the P.P.A. would soon cease to exist.

WILLIAM COLES.

18, Queens Road, Watford,
October 24.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

L. L.—The Williamson aerial camera is made by the Williamson Kinematograph Co., Hawthorn Road, Willesden, London, N.W.10.

E. H.—The firm for brass camera parts is Messrs. James Christie & Sons, Ltd., 246, West Street, Sheffield. For optical repairs, the Premier Optical Co., 63, Bolton Road, Stratford, London, E.15.

L. B.—We think you will be able to get what you want from Messrs. Garratt & Atkinson, Warwick Works, Ealing, London, W.5, who have a very large selection of stereos of decorative headings, etc., and can quickly get out a new design to any requirements.

H. T.—Your difficulty is due to the short depth of focus in your f/5.8 lens. For groups, such as the prints you send, we should advise you to stop down to f/11 at least. Focus sharply at full aperture upon a figure midway between the extremes, then stop down to f/11 before exposing.

H. C.—We should think the "mealiness" you complain of is due to scum on the surface of your developer. If the developer had become nearly exhausted a scum would form on the surface, and unless the print were moved about in the bath this would adhere to the surface, and give small, uneven markings.

W. U.—We suppose it is a half-tone impression on newsprint, in which case it will make a very poor lantern slide. About the best thing you can do is to make a copy on a very rapid plate, the spread of light in the emulsion of which does something towards removing the half-tone structure of the original.

E. D.—For such work as you require you should send the negatives to somebody who will take a personal interest in carrying out such "faking" himself, and is an expert in this line. We recommend for this purpose Mr. H. W. Bennett, 17, Ranelagh Gardens, Ilford, Essex, or Mr. John H. Gear, 8, Nottingham Terrace, Marylebone Road, London, N.W.1.

R. T. S.—The reflected-light vertical enlargers give a softer rendering, and do not show up scratches or retouching of the negatives. However, the exposures necessary are of longer duration than those with a lantern using a condenser. In the Aldis-Ensign vertical enlarger, however, a special condenser is used in which shorter exposure is combined with a measure of diffusion.

R. H.—Tri-colour filters are obtainable from Messrs. Kodak, Ltd. (Wratten Division), Kingsway, London, W.C.2, or Messrs. Sanger-Shepherd & Co., Ltd., 5-7, Gray's Inn Passage, High Holborn, London, W.C.1. The best book for your customer is "Science and Practice of Photography," by Chapman Jones. This is now out of print, but you could probably obtain a second-hand copy from Messrs. Foyle, 121-123, Charing Cross Road, London, W.C.2.

R. L.—There are numerous remedies for amidol and metol skin poisoning, some of which benefit some people and some, others. A formula which in our experience has been beneficial to many people is one which we publish in the "Almanac." There is no ready method of removing amidol stain from the skin. The best thing you can do is to use pumice stone, and, as a preventive, rinse the hands in water containing a little hydrochloric acid every time after handling the developer.

C. R.—There is no book which will enable a person to carry on studio work without personal instruction. The little manual, "The Portrait Studio," which we publish, gives a good deal of information on studio portraiture, and as regards the general principles of photography, about the best book is "The Science and Practice of Photography," by Chapman Jones, at present out of print, but no doubt obtainable from Messrs. Foyle, 121-123, Charing Cross Road, London, W.C.2.

H. A.—So far as we know, there is no firm now that makes photographs in cameo relief. This was a specialty years ago of the Taber Bas Relief Co., but we do not think they are now in existence. There is a French firm, M. Phidias, 368, Rue Saint-Honoré, Place Vendôme, Paris, who makes these relief photographs in colours, but at price of about £5 5s. apiece. For the white mounting boards we advise you to apply to Fordham & Co., Ltd., Victoria Works, Victoria Road, Walthamstow, London, E.17.

G. B.—We do not know of any other method which can be used than ordinary enlarging on bromide paper. Presumably only one enlargement is required from each original. If more than one is required it would perhaps be cheaper to make an enlarged negative on thin bromide paper, and make duplicates from that on ferro-prussiate or blue-print paper. You could easily have these blue prints made from your negatives by a firm such as B. J. Hall & Co., Chalfont House, Great Peter Street, Westminster, London, S.W.1.

G. W.—We do not quite understand your query, since "art" paper here is usually paper with a coating of mineral matter for a high gloss, and we do not suppose for a moment that is what you mean. We should say the purest rag paper, and one also which is of artistic surface suitable for mounts, is Whatman's drawing paper, made by Messrs. Joynson, St. Mary Cray, Kent. It is a regular article among dealers in artistic requisites, no doubt in your town as well as here. A firm here which would supply is Messrs. Reeves & Son, 4, Farringdon Avenue, London, E.C.4.

J. H.—We should suggest that you fit three 3,000 c.p. half-watt lamps on rising and falling fittings, suspended from above and near the wall on the right-hand side of your studio. The lamp nearest to the sitter should be about 10 ft. from the background and the other two as near to this as practicable. Another 3 000 c.p. lamp should be provided on a movable stand for use on the left-hand side of your camera, if necessary. This could be moved about the studio into any position required, either to increase the existing lighting or brighten the shadows. A lamp could also be provided hanging from above, as No. 4. This should be about 9 ft. from the ground, and encased in an opal bowl; 2,000 c.p. would be sufficient. The light from this could be reflected down from the top blinds, which would have to be of a white material. We have marked the position of the four lamps on your plan, and these should be hung in such a manner that each lamp could be placed near the floor or the ceiling as required. You will have to provide diffusing screens for all the lamps except No. 4, and these would be best if fitted to the lamp bodies. The General Electric Co., Magnet House, Kingsway, London, W.C.2, make a specialty of studio lighting, and would forward you their booklet giving prices and particulars of their various fittings upon application.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. PRICE FOURPENCE.

TERMS OF SUBSCRIPTION POST FREE.

UNITED KINGDOM OR CANADA.—*One Year*, £1 1s. 8d.; *Six Months*, 10s. 10d.; *Three Months*, 5s. 5d.

ANY OTHER PART OF THE WORLD.

One Year	£1 3s. 10d.
Six Months ...	12s. 0d.
Three Months	6s. 0d.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibits the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3261. Vol. LXIX. FRIDAY, NOVEMBER 3, 1922. Price Fourpence.

Contents.

SUMMARY.

Working instructions in the use of sulphuric acid as an accelerator of hypo-alum toning are given by "Thermit" in a note on page 665. Prints are passed first through a bath of 1 or 2 per cent. sulphuric acid, then through weak fresh hypo solution, and then into the alum-hypo toner.

In continuing his notes on accessories and backgrounds in the studio, Mr. J. Effel has much useful advice to give on the avoidance of artificial accessories and highly scenic backgrounds. (P. 663.)

In a leading article we endeavour to present in a popular form a short discussion of the effect of distance of camera and focal-length of lens, both in studio portraiture and in the photography of somewhat large and near objects, such as motor cars. (P. 662.)

Good use may be made of an exposure meter in estimating the strength of studio light when employing an arc or half-watt lamp as a supplement to daylight. (P. 661.)

It is expected that judgment will be given within the next day or so on the appeal of Messrs. Wykeham Studios, Ltd., against the decision of the High Court some months ago respecting power rates for electric current used in studio arc lamps. (P. 671.)

Several correspondents give their experience and advice on safe-lights for dark-room illumination when handling bromide paper. (P. 671.)

In enlarging scratched film negatives, much touching of the enlargements may be obviated by varnishing the films with a brush or by immersion. (P. 661.)

Both too slow and too rapid drying of negatives involve certain drawbacks. In a note on page 662 we refer to a medium speed method of drying which is useful at the present damp season for negatives which are required without loss of time.

At the Royal Photographic Society on Tuesday evening last Mr W. B. Appleton gave an interesting discourse on past and present methods of making photographic lenses. (P. 668.)

"COLOUR PHOTOGRAPHY" SUPPLEMENT.

In a recent paper contributed to the "Club Photographer," Mr F. G. Tutton has given working details of the process used in the making of the three-colour transparencies to which a medal was awarded in the recent exhibition of the Royal Photographic Society. Mr. Tutton used chemical toning and dye-printing in combination. (P. 41.)

In a contributed article, Mr. R. M. Fanstone gives some hints on the making of Autochrome and Paget transparencies in small sizes. (P. 43.)

M. Eugène Muller records his experience in using desensitising by aurantia in the development of Autochrome plates. (P. 44.)

Full particulars have now been given in a patent specification of the before-lens optical device used by Professor Procoudine Gorsky for splitting up the light into three beams in his process of colour cinematography (P. 42.)

EX CATHEDRA.

Mixed Light in the Studio. On dull days it is sometimes advantageous to secure a little more brilliancy in the negative by employing supplementary illumination from a half-watt or arc-lamp. The chief difficulty in doing this is that of correctly estimating the value of the combined lights for the purpose of exposure. This we have found may be done by using an exposure meter, the simplest being as effective as the most complete, since all that has to be done is to match the tint by daylight alone, note the time, and then to get a second tint with the addition of the artificial light. The exposure will be, roughly, in direct proportion to the respective times. It is, of course, assumed that the correct exposure for daylight alone is known. If this be not the case the exposure may be calculated entirely by the aid of the meter used in the orthodox way. We have found with an ultra-rapid plate and an aperture of *f*/5·6 that for a half-length portrait about half a second per meter minute (full tint) gives ample exposure.

* * *

Scratched Films. In enlarging film negatives which have become scratched by carrying in the pocket without proper protection, a great improvement may be effected by coating both sides with varnish, which fills up the cracks and restores the general smoothness of the surface. It is, however, important to avoid the use of any varnish which contains alcohol or amyl acetate. Ordinary negative varnishes or any solution of celluloid will probably cause the film to buckle. Varnishes made with benzole or turpentine are free from this defect, as are also aqueous solutions of shellac made with ammonia or borax. It is possible to apply the varnish with a brush, but it is better to make it quite thin and to immerse the negative entirely. If a water varnish be used the negative may be printed from as soon as it is dry, but with other solvents a couple of days should elapse before the film is put in contact with either glass or paper.

* * *

Getting Business. There is a striking difference between the way the ordinary manufacturer or first-class retailer goes about finding customers and that adopted by most, but not all, photographers. The manufacturer relies upon direct attack; he uses his trade papers as a means of broadcasting knowledge of his goods, but he knows that unsupported this will only be partially effective. Therefore, he sends to his possible or prospective customers not only circulars but personal letters drawing their attention to certain lines, and still further backs these appeals by sending a personal representative to demonstrate and display his leading lines. Our readers are quite aware of these tactics, for are they not carried out by our leading plate, paper, and apparatus firms! Obviously, such lines cannot be followed when

dealing with private people, but the idea of the direct and the renewed appeal is worth considering. Why should not a photographer who wants the Christmas orders of certain good people in his neighbourhood begin at once to make it clear to them that he is not only willing but able to meet their requirements and to demonstrate it by specimens? The cost would not be great and the risk of giving offence less.

* * *

Drying Negatives. Although the effect of rapid drying upon the density of a negative was noted in the early days of gelatine emulsions, it has only been pointed out recently that the size of the silver grains is affected in a similar way. Most old photographers have long recognised that drying with spirit or formaline, followed by heat, not only increases the density of the image, but destroys the "bloom" which is characteristic of a good negative, the image assuming a somewhat harsh or "wiry" appearance; they were therefore chary of drying important negatives in this way. A middle course which may be followed when an hour or so can be allowed for drying, is to remove all surface moisture from the film with fluffless blotting-paper or a fine linen handkerchief, and to place the negative in a current of air which can be produced, when possible, with an electric fan, or, failing this, by raising a window-sash to the height of the negative and standing the negative rack in the draught which is generally produced.

FOCAL LENGTH AND PROPORTION.

In discussing the effect of the focal lengths of lenses upon the appearance of the images produced by them, it is probable that the word proportion will be more readily appreciated by most photographers than the nearly synonymous one, perspective. Perspective is to most people a matter of straight lines, planes and vanishing points, and the everyday photographer finds it difficult to associate these with the features and limbs of a sitter or the outlines of a piece of furniture.

As a rule, a person of ordinary intelligence, who is entirely ignorant of the laws of perspective, is quite capable of recognising any serious infraction of them. He realises that the drawing or photograph is "out of proportion," or, perhaps, even more vaguely says that it "does not look right." This perceptive power naturally varies greatly with different individuals, some being able to detect faults in pictures of unfamiliar objects, while others could only do so when the originals are well known to them.

The whole art of representing solid objects upon a plane surface is based upon the fact that any object of a given size subtends a narrower angle with the eye or the photographic lens as the distance between it and the eye or lens is increased. A familiar illustration of this is furnished by the action of the art student who gauges the various objects in his subject by holding up his pencil and sliding his thumb upon it, afterwards marking the dimension so obtained upon his paper. Here we have a triangle, the base of which is the uncovered part of the pencil, the apex is the eye of the artist, and the height the distance between these two. Let us assume the latter to be fifteen inches, and proceed to carry out the operation by photography instead of by hand. To do this in the simplest manner we require only a box measuring fifteen inches from back to front, having a pinhole in the front and a plate or sheet of bromide paper fixed inside the back, the pinhole occupying the position previously held by the artist's eye. Upon development, we shall find that the image thus obtained corresponds in all its dimensions with the artist's sketch, assuming, of course, that he has accurately followed his measurements. This brings us to the point, that it is the standpoint, or rather the distance between the lens and the principal object, which is the controlling factor in photographic perspective. The greater this distance the less the apparent discrepancy in size between two objects which are actually the same size but are at different distances from the camera. This may be well illustrated by photographing the corner of a building so that the sides are oblique to the lens. If an 18-inch lens be used, at a distance of 120 ft. upon a whole plate, the convergence of the horizontal lines will not be too sudden, but if it be rendered necessary, by the presence of other buildings, to use a 6-inch lens, the unpleasant wedge-shaped "wide angle" effect is immediately produced. The size of plate and focal length of the lens used make no difference in the result, since, if a certain building can only be taken from a certain near standpoint, the top and bottom of such building and the lens form a triangle, and to obtain the angle subtended by the lens a certain proportion between the longest side of the plate and the focal length of the lens must be maintained. In other words, a 4-inch lens upon a 5 x 4 plate will give from the same position exactly the same rendering as an 8-inch lens upon a 10 x 8 plate, except, of course, that the linear dimensions of the latter will be doubled.

It is often said that short-focus lenses, when used upon open landscape, "dwarf the distance," but this seems rather a confusion of terms. What really happens is that foreground objects have to be approached so closely that they appear too large in proportion to the known dimensions of more distant ones. If a small cottage, with a wooded height far behind it, be taken at a distance of 300 yards with a lens of normal angle, say, 40 degs., the cottage will appear insignificant, but in agreeable proportion to the distance. Upon approaching to 20 yards the cottage will be many times larger, but the distance will practically be represented upon the same scale. This effect is not produced upon the eye of a person in the same position since he unconsciously views the cottage and the mountain as separate entities, which cannot be done with a photograph. That this is a fact is proved by the practice of Turner and other great landscape painters, who did not hesitate to exaggerate the altitude of their mountains and cliffs when they deemed it necessary.

Coming to portraiture, these principles are equally applicable; the violent perspective is even more harmful and unfortunately less easy to detect. An instructive experiment is to take two large cabinet heads, with lenses of 6 and 18 inches respectively, so that the head is of equal height in each. The distance with the latter lens will, of course, be practically three times as great as that with the former, and the enormous difference in effect will be due to this only. Using a 6-inch lens for a 2½-inch head is, of course, an absurdity, but it must be remembered that the effects which are so evident exist in a lesser degree in portraits taken with an 8-inch lens, and in rapidly diminishing amount in other focal lengths, till the 18-inch is reached. It may be that the sitter is not rendered hideous, but there is a loss of likeness which cannot well be accounted for by any other hypothesis.

The conclusion to be drawn is that in all cases of outdoor work the longest possible focus should be employed. For motor cars and similar subjects even a telephoto lens is often useful, while for portraiture a distance of five feet between the sitter and the lens

should be the least. If larger heads than the lens in use will give at this distance are required, then enlarging should be resorted to or a larger lens obtained. As a rule, the front combination of a portrait lens used alone will give an image one and a half times as large as the complete lens will at the same distance, and thus the problem may often be solved in a very inexpensive way.

WITH A PORTRAITIST IN THE STUDIO.

[In the present paper, of the series of articles by Mr. J. Effel, which has been appearing in recent issues, the author talks of accessories and backgrounds, and, from instances in a wide experience, urges the abandonment of the many artificial accessories still to be seen in portrait studios. The next article of the series will deal with hands and feet and full-length portraits.]

IX. *(continued)* - ACCESSORIES AND BACKGROUNDS.

I am not a kill-joy or a spoil-sport, and I would always succumb to the wiles of the seaside tout and get a "while you wait" of myself seated on the moon or steering an aeroplane; I will admit that there is hardly a ghastly accessory in existence that I haven't used, but these facts have nothing to do with the artistic varieties. I would not take from the beach photographer his pasteboard motor or rowing boat, nor would I suggest that he would do better without these properties. I only ask you to fully realise what you are doing, and in what category your work ought to be classed. The seaside "mug-faker" is generally a very astute gentleman, and has no pretension to the title of artist; he talks about our profession as a "game," and refers to accessories and their uses as "fakes" and "stunts." I have nothing but goodwill for this brother photographer who is generally a very cute psychologist. I am addressing these articles, however, to young photographers in business in the ordinary way, and those who hope to make their living by supplying serious portraits to the public, not merely funnygraphs for holiday makers. The imitation Rolls-Royce could not deceive a blind man, and even the smallest knowledge of astronomy should tell us that man's place in the universe is not of the generous proportion he is accorded on the lap of the queen of night. As I have said, no sane person would take those things seriously, but I certainly feel that the city "portrait specialist" who shows in his case, *and quite seriously*, all those monstrosities I have been writing about in my last article, has no earthly reason to laugh at the itinerant.

If a man says to me "Yes, I know that seat is out of place with that background, but it was the first and only exposure I made of a very difficult child," or "My clients like to be 'took' with fine scenery," I quite understand him. A man may have to split artistic infinitives many times daily to earn his living, *but so long as he knows*, his soul may yet be saved. But if he is going on from day to day producing the same old goods, working the threadbare accessories and the more threadbare positions, and uninteresting lighting, *and has the audacity to think he is a live man*, I hope he may be persuaded to read my articles.

Whether the general scheme we are working for is to be simple, decorative, or elaborate, the figure of the sitter must be the first consideration, and must suggest the tone of the background, and indicate if an accessory is needed to help the composition. In my studio, I have not in use two chairs of the same height and design. Take the usual standing figure portrait and look at it critically. One hand is hanging loosely, and the other is placed on the back of a chair, a stone wall, a pillar or a table. We may have different pedestals, chairs and tables for use with children, but adults are all thought of as medium sized. Take away the bridge from under the sitter's hand, push in the latest posing device, ring down the new interior background, and yet you only succeed in changing externals which signify little. As the French would say, the more you change the pose, the more it is the same. No amount of thimble-rigging with furniture and scenery will make interesting the work of the operator who has very little knowledge of art anatomy, no appreciation of beautiful lines and curves in figure and clothing, *and who has never practised selection with a model, for ten minutes in his life.*

I must say honestly that it takes my breath away to hear some of the grousers in our business. I remember once advising a fairly intelligent assistant to practice posing and lighting in his spare time, and offered him the benefit of my guidance. "I came here to print bromides, and I don't want to be teached about art galleries and statues with lumps chipped out of them," was his delightful reply, "when my work's done of an evening, I want a game of billiards; no art classes for me."

I didn't get offended at this reception of my friendly overture, but I made an appointment with Tom, and gave him something to think about in the way of billiards. I finished up by giving him a hundred in three, and a thirty break, and a good hiding. Then we sat down for a drink and a chat. He was enthusiastic about my cuemanship, and wanted to know the secret. There was nothing to know except that where he had likely played more games than I, I had studied theory and sound break-making methods, and had put in a good deal of practising.

"But look here Tom," I protested, "there are hundreds of players who could knock my head off." Yes, he admitted that although useful as an amateur, I would be a poor antagonist for even a third class professional. That gave me my chance, and I pointed the moral in fine style. For years and years a budding billiard crack will spend hours daily in hard and patient practice, and yet the chances are less than one in a hundred that he will be able to earn a living as an exponent of the game, the proficiency of the top-notchers being so extraordinary that a very high standard of play is necessary for any player who aspires to appear in public as a performer. But surely portrait photography is as difficult as playing billiards? Yes, anyone can knock balls about and deceive himself that he plays billiards; and anyone can take a photograph on the "keep steady, one two three" principle, but for the professional standard, something better is needed. If a photographer is not content to take as much interest in his work as a marker does in billiards, he ought to go out of the business, before the public starve him out. Think of the men at the top of the tree in our business. They are as skilful with the camera as Newman or Inman with the cue, and the standard of work set for the young competitor in portrait making is a very high one. Fortunately, photography invariably maintains its fascination for its devotees through all the years of hard work. I would leave the business to-morrow if it wasn't that I get so much fun out of it. It would be a fitting end to my moralising if I told how Tom stuck in at his work, opened a studio, did beautiful pictures, made a fortune, and joined the P.P.A., but I am a truthful person. I am glad to say, however, that my old assistant is now doing well in a fruit shop of his own. Human beings are droll creatures!

Tom seems to me to work twice as hard now, but as he prefers pomegranates to photographs, well, good luck to him. I would say again to Grouser, if our business is played out, as you say, for goodness' sake play your miserable self into something that will suit you better.

Now, let me come back to the question of accessories and backgrounds. I am neither a Gordon Craig nor a futurist. I do not tell you to make a bonfire of your posing properties, for it would be unkind advice to a cripple to throw away his crutches until he was strong enough to walk. Yes, you may not like it, but artistically you *are* a cripple, and you make one of your client if you rely overmuch on accessories. In previous articles I have taken up a good deal of time with verbotens and defendus and homely dont's. Let the ambitious student extend the list. Take an ordinary kitchen chair, and a model; then, with no other accessories, save perhaps a flower or a letter, try very hard to get a big range of standing and sitting positions. Walk all round your sitter, and if you choose, expose midget plates. For most standing figures, have the chair out of the way; if the sitter is a lady, she will have so many personal things that will serve as real accessories, gloves, vanity bag, beads, fur stole, etc., which will occupy the hands in a perfectly natural and convincing way. At first you will be nervous, and will be inclined to look round for your crutches, but if you manage to stick it out, you will surprise yourself, and find that you have gained so much in strength that you are no longer a cripple.

Apart altogether from the canons of art, there is a factor that cannot be ignored, the consideration of fashion. A photographer must take a wide view of things, and apprehend the evolution of ideas concerning all the arts. Modernity and a refinement of criticism have had wonderful effects on literature and the drama. Evolution by no means signifies improvement, but merely change. Enough for us to understand that change. *All art is one.* Shakespeare would have to serve up his plays differently to-day. I can imagine a smart manager addressing the bard thus:—"This 'Merchant of Venice' is the goods all right, Shakey, my boy, but all this foolery between Launcelot Gobbo and his father is like the flowers that bloom in the spring. We'll have to cut that out, old bean, for our public won't stand for it as they did in your day." Sir Walter Scott might be told to cultivate précis writing, by a modern editor, and it is a sure thing that a young author who wrapped up his romance in a wealth of descriptive detail, would have difficulty in finding a publisher. The tendency of the age was expressed by Ibsen to Björnsen (not in my hearing), "Less of the glaciers, of the thunderstorms, of the moods of nature, and more and more of the heart and soul of man."

Photography must fall into line. Beautiful as they are, Birket Foster water colours, with their wealth of detail are out of date. Victor Hugo's day is past, the direct method of De Maupassant, who never used a superfluous accessory or background, has conquered. As Phil May rubbed out from his drawing every line that did not materially contribute to the story he was illustrating, so the portrait student should work.

The white background was hard on those who formerly favoured the elaborate, a portrait with nothing else but the sitter either possessed some intrinsic merit or was shockingly bad. It was a difficult style to work for those who, like myself, are fond of losing awkwardness of outline, but it was a splendid training to take all sitters for a time with the same ground. I remember about the end of the war period, talking with a brother professional (Mr. Charles Haig, of Belfast), who made a great hit with sketch portraits. He was unrolling a dark background which had been out of use for some time, and he remarked that he must have taken 20,000 sitters in succession with the same white background! And yet there was wonderful variety in the work both in lighting and posing. I think that should be conclusive evidence that a big business can be done with the minimum of accessories and backgrounds. It appears that the day of the sketch style has now gone, but a plain white ground is almost sure to be frequently required, particularly for costume and general theatrical work. I sometimes wonder if photographers like paying out money for reflectors, screens and the like, which they could easily make themselves. The white background is a case in point. There is scarcely a studio which has not one end that can be treated with distemper, and make a far more satisfactory background than a canvas screen. Children may lean against it, tricky effects with shadows can be worked, and while there is never any fear of the slightest wrinkle, dirty marks can be instantly touched up. A splendid "continuous" effect can be made by white painted linoleum, fixing the latter to the wall about a foot from the ground and shaping it to curve to the floor. If the edge of the linoleum is neatly bevelled and joined, before the final coat of white, you will have the most serviceable white continuous background extant. It may be necessary to point out that a large white expanse should always be covered when working with a darker screen, otherwise there will be difficulties with the lighting.

So much has been written about sketch work that I do not wish to risk mere repetition. It is pretty generally known that the tone of a background is subject to very great modifications, by placing it near the sitter or far away, angling it slightly, or allowing independent light to illuminate its surface. Light grounds which approximate to flesh tones sometimes give quite unforeseen results, particularly with figures turned towards the light. Frequently the face and light clothing "run in" to the background. In a previous article I advocated a slight exaggeration of contrast in lighting to make up for the loss of colour. Under exposure will heighten contrast, but by far the best way for the busy worker is to have standardised methods of working which will give the minimum of trouble. Avoid the picture with face or figure turned towards the light when the background is of the "lighter than the subject" order. Light blouses, dresses, and babies' robes can stand all the shadow you can get into them. I am all the time thinking of tank development and straight printing. Doubtless good "high key" effects can be got looking to the light, but it is asking for trouble, and putting an undue strain on the busy printer. It is almost an unbreakable rule with me to turn all white garments away from the light, and to lower their tone as much as I can. A little dark screen about four feet high is useful in this connection.

Many up-to-date photographers have now completely abandoned the scenic background. That is a healthy sign. The alleged "interior" with the marble steps (well wrinkled) growing out of the drawing room carpet and vanishing at a stained glass window while palm trees sprout from the fireplace on the right, and the book-case is suspended in space at the other side, deserves a well-earned rest. In my boyhood I served a good apprenticeship to the scenic school. The boss was a maniac on the subject, and invented a complicated bit of mechanism to hold eight backgrounds, the one desired being supposed to come into position in response to the touch of a lever. That I understood was the theory, but in practice, the working resembled the antics of the folding bed which turned itself into a pair of steps in the middle of the night and refused to be coaxed back into any other combination except a washing machine. There was a numbered list with titles of the backgrounds, but that was only camouflage, for as sure as you decided for a "dark interior" the snow scene would unfold itself. True, you might say this was easy, and that it went by opposites, but there was a more subtle perversity behind this Frankenstein monster. If a garden scene happened along, and you were resigned to bear the ills, etc. (Shakespeare), and placed your sitter to your satisfaction, wild breakers would suddenly appear in the sky, descend leisurely on the horizon, gather momentum by contact with the sun-dial, and flood the garden with surf, sand, wrinkled

rocks and flotsam and jetsam. Frequently a stout roller made a striking appearance—on the head of the unfortunate posee. Inventors are optimists, and these disturbing incidents did not daunt the boss. A sitting was never completed in my memory without the other apprentice and I standing on chairs holding a background in position, and preventing the other seven from acting in concert against us.

Years later, when starting in a new job, I saw one of those cursed contrivances in the studio. I protested at once, but the proprietor sought to mollify me by the assurance that only one of the rollers worked, and that it was therefore quite harmless. He said he only kept it for appearance, but that was my greatest objection to it. I put my foot down, and refused to be put off by the suggestion that he would advertise the clumsy thing in the "B.J." Either the octagon—revolving—automatic—time-saving background stand left the studio at once or I did. I won my point, and started work with a light heart.

The remark that accessories should be regarded as suitable in conjunction with certain backgrounds ought to be tautological. Still, there are many accessories which are always used in what is thought to be the correct relation. I have known a piano with a forest, but never a deck chair in a drawing-room. The seashore is its proper place, suggesting that the bitter experience of being bilked out of twopence on his annual holiday has made a lasting impression on the photographer. I am a land lubber, and I think barrels and a coil of rope are nautical, but all the same I would rather not try those on a sailor. Jack sees plenty of the real sea, and much prefers to be taken seated in the parlour. Think for a moment, you would not dare to photograph a gentleman in an imitation motor, and yet you would lightheartedly take the battle-scarred soldier against paper tents, and think the illusion good!

Scenery has been superseded by simulation. I think the alleged panelling deceives as little as distemper or flatted oil. Three-ply board is useful, but with bits of egg box strapped across it at intervals of eighteen inches and stained with Condy's Fluid does not suggest opulence. I find it difficult to get away from the painted ground because in the best of them there is that fine distribution of light and dark masses, the use of which is as old as the art of Leonardo da Vinci. To me the great drawback with the plain wall type of background is the absence of relief. With the plain white ground, a little shading can be worked in on the print and the dead black ground is subject to considerable modification in the negative with a retoucher of average skill. A picture, flowers, or light piece of furniture, if carefully placed, will often afford that little bit of contrast needed to relieve an otherwise too plain scheme. Curtains are very amenable, and an odd half-hour can well be spent in arranging folds and studying effects. Why anyone outside of a lunatic asylum would order a painted canvas of a curtain, when the real thing was to be had much cheaper, is entirely beyond me.

Accessories then are aids to photographing our sitters, not merely objects with which they are photographed, and backgrounds should serve in an unobtrusive manner the purpose of throwing into relief the face or figure, and in some instances "losing" the shape of the sitter. I will deal more fully with this function of the background when treating full length figures.

A very good tip was given in this journal some time ago about the choice of studio furniture. It was suggested that the prospective purchaser should experiment a little with a lady in one or two poses with the chair or couch. It will be found that many pretty bits of furniture are quite unsuitable for general use, owing to their height, the style of the arms, or the lean of the back. That is why I always have alternative seats slightly different. Nothing looks more awkward in a sitting pose than an arm pushed up to hang on a projecting part or table. Comfort is not necessarily grace, but discomfort can never have pictorial merit.

The serious photographer must eschew the dear and nasty as well as the cheap and shoddy in accessories. Some chairs are good with certain subjects and settings only, and some are good with none. "Paper mashy" and all imitations must go. The white seat is my bête noire. The tendency of the age is towards simplicity and away from the ornate. I shall paraphrase the old Norwegian master and say:—

"Less and less of the pillar, the painted screen, and the fancy furniture, and more and more of the face and figure, and the character of the sitter."

J. Eftel.

SOME MODIFICATIONS IN THE ACCELERATED HYPO-ALUM TONING.

That the usual way of "boiling prints till they turn brown" has certain objections will be admitted by most of those who have stood over the hypo-alum bath for an hour or two on end, and early this year I described a method I had devised to improve the hypo-alum process. This was published in two short articles ("B.J.," 1922, February 10, p. 80, and March 3, p. 126), and since then I have tried out the system further in business. Constant practice with a process is bound to discover any failings, and should lead to practical improvement, and this has been the case with accelerated hypo-alum.

Originally, I transferred prints from the fixing bath (plain hypo) to a bath of 8 per cent. sulphuric acid. Sometimes I used stronger acid than this. From the acid I put the prints into a warm hypo-alum bath, but seldom bothered to turn them. Sometimes I left them in warm water, where they eventually toned without the help of hypo-alum, but I could never say what time they would be done. The warm hypo-alum bath was well worth while.

I had found everything satisfactory for some time, when I suddenly discovered that there was a possibility of staining through allowing used hypo to remain in the prints when immersed in acid. Silver thiosulphate, decomposed by the acid, one day caused a number of immovable yellow stains in the whites of a batch of prints. And once or twice I had cases of bleaching. Certain slight alterations in the *modus operandi* put matters right, and though the process—on paper—now seems more elaborate, it is safer and more definite and certainly preferable to the old-fashioned way of "boiling, etc., etc."

Prints fixed in plain hypo are washed for five minutes. If acid hardener is used, a longer wash may be necessary. From this wash, prints are transferred to a 1 or 2 per cent. bath of sulphuric acid. Stronger acid can be used, but I have found no advantage in increasing the strength. Dry prints put into the acid remain until they are limp. Wet ones need two minutes, and if there is a quantity they need turning over. The next step is to drain them for a moment and immerse in weak but fresh hypo solution, which must not have any traces of sulphurous acid in it. That is, it must be free from sulphite, metabisulphite, or acid hardening mixtures. A strength of 1 or 2 in 20 will do. Here the prints are turned about till the solution turns very cloudy, when they are ready for the toner. The action in the weak hypo takes a minute or two. If warm toner is not available, a good rinse, followed by immersion in warm water will finish the process, but an hour or two may be necessary. In no case should turning over be necessary after the cloudy action.

It may be well to note that forced prints, and prints on certain makes of paper—distinguished by their ability of giving dead cold blacks in spite of adverse treatment—do not readily tone brown by this (or any other) process. Generous exposure and smart development in moderately restrained developer are great helps to expeditious toning.

Thermit.

£2,000 Found in a Camera.—Mr. Henri Bourdin, the "Daily Chronicle's" special correspondent, telegraphed the following item of news from Paris: Two small bags, each containing £1,000 in gold and notes, were found by a grocer named Binjon, of Fontainebleau, in an old camera which he had bought at an auction sale. It had belonged to an aged priest, and the grocer has handed the money to the dead man's heirs.

FORTHCOMING EXHIBITIONS.

November 4 to 11.—Bournemouth Camera Club. Particulars from the Hon. Secretary, 88, Old Christchurch Road, Bournemouth.

December 9 to 31.—Rochdale Amateur Photographic Society. Particulars from the Hon. Secretary, W. Lord, 10, Derwent Street, Rochdale.

1923.

February 5 to March 3. Northern Photographic Exhibition, City Art Gallery, Manchester. Latest date for entries, January 12. Particulars from the Hon. Exhibition Secretary, Walter Johnson, 30, Hartington Road, Chorlton-cum-Hardy, Manchester.

March 1 to 8.—Birmingham Photographic Society. Latest date for entries, February 15. Particulars from the Hon. Secretary, J. E. Breeze, 178, Broad Street, Birmingham.

March 2 to 31.—Pittsburgh Salon of Photography. Latest date, February 5. Secretary, Charles K. Archer, 1,412, Carnegie Building, Pittsburgh, Pa., U.S.A.

March 13 to 16.—Exeter and West of England Photographic Exhibition. Particulars from the Hon. Secretary, Frederic G. Tutton, 9, Union Road, Pennsylvania, Exeter.

March 15 to 24.—Photographic Fair, Holland Park Hall. Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications October 16 to 21 :—

FILM HOLDERS.—No. 28,577. Holders for photographic film. C. F. Abbott and Kodak, Ltd.

PRINTING FRAMES.—No. 28,017. Method of manufacturing photograph printing frames. P. G. Henry.

PROJECTION APPARATUS.—No. 28,181. Micro projection apparatus. F. N. Davidson.

FERRO-PRUSSIATE PAPERS.—No. 28,430. Production of sensitive ferric film photo papers or bearers. H. L. Shawcross.

PHOTOGRAPHIC SURVEYING.—No. 28,507. Photographic surveying. J. W. Gordon.

AUTOMATIC PROJECTION.—No. 28,293. Automatic machine for projection of a number of photographic slides, etc. I. O. Bullock.

CINEMATOGRAPHY.—No. 28,555. Cinematograph films. E. T. Perken.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

PRISM LENS SYSTEM, FOR THREE-COLOUR CAMERAS.—No. 185161. (April 30, 1921.) This invention consists of an arrangement of three prisms, mounted in such a manner that the incident ray, striking the first prism face, is split up into three separate images before entering the lens system. A series of rhomboidal prisms are cemented together, to form one combination prism, which is then mounted in front of three lenses. The coplanar faces of the prisms are partially silvered or rendered partially reflective so that each prism face reflects separate image rays. These are then passed through three lenses on to the sensitive film or plate surface. As the distance traversed by the image forming rays varies in each instance, the lenses must be mounted in such a manner that each will bring the rays to a sharp focus in the general focal plane, when only one sensitive surface is used. The lenses have their focal lengths corrected for use with light-rays of a definite wave-length, corresponding to a region of the spectrum occupied by the rays passed by the colour-filters used.

A variation of the system allows three films or plates being used, the lenses being then placed at equal distances from the prism face. In the case of a cinematograph camera, the film gates are placed in parallel planes to each other, but at different distances from the central axis of the combination prisms. Various methods are provided for correcting distortions of the images. One method is to equalise the path of the light-rays, in the media through which the rays pass, while another for use when ordinary photographic lenses are used, is to place a sphere parallel lens or lenses, in front of the system of prisms or each objective. Serge Michael de Procoudine Gorsky, The Dell, Croft Road, Sutton, Surrey. (Particulars of the construction of the system are given on another page, in the "Colour Photography" Supplement.)

New Books.

LENSES IN USE.—No. 187 of the "Photo-Miniature" is a practical guide to the choice and use of lenses, for different branches of photographic work. Some workers do not realise the importance of the lens, or its possibilities and limitations, imagining that one type of lens should be capable of dealing with all classes of subject. That the expert photographer is able to turn out good work even with indifferent tools cannot be denied, but it is readily understood that, given the very best of suitable materials, he would be able to do even better. But with the finest anastigmat some photographers would fail to produce good work, because their knowledge of the instrument they are using is scanty and insufficient. It is with the idea of educating the photographer to the possibilities of his lens, that the present volume is issued, and a careful study of its pages will do much to improve the worker's knowledge, and through that, his work. Lenses of all types are considered very fully, and their possibilities and limitations explained. Portraiture in the studio demands certain qualities in the lens, which qualities are not always found in the modern anastigmat, but the author advises the use of the modern portrait anastigmat, as he considers it a great improvement upon the Petzval type of lens. Soft-focus lenses are not dealt with in this volume, their qualities being explained in No. 184 of the series. To the worker who is endeavouring to get the best out of his apparatus, we commend the present volume for careful study. The "Photo-Miniature" series of booklets are obtainable from Messrs. Tennant & Ward, 103, Park Avenue, New York, price fifty cents, or Messrs. Houghtons', Ltd., 88, 89, High Holborn, London, W.C., price 1s. 8d.

LA TECHNIQUE CINEMATOGRAPHIQUE.—Perhaps the most complete treatise ever published upon the details of the manufacture and display of cinematographic pictures is this volume, in the French language, bearing the above title, from the pen of M. Leopold Lobel. Throughout the 354 pages of profusely illustrated text M. Lobel gives his readers the history of cinematography and the apparatus involved, together with its very latest applications. The mechanism of all the most popular types of projector is most fully explained, and many excellent illustrations and diagrams are given. The illuminant is carefully discussed, and various types of electric arc lamps and machinery for generating the necessary current are described.

The oxy-acetylene system of illumination, which is extremely useful under conditions where electricity is not available, is very fully described, methods of manufacturing and purifying the gases being given. The arrangement and setting of the studio claims a chapter to itself, while the methods of artificially illuminating the studio are very fully described. Many types of cameras are discussed and their advantages explained, while the great variety of camera stands, with their numerous and intricate adjustments, are given very full attention. The chapters upon development and printing of both the negative and positive film are ably written, and should prove of great interest to photographers who cater for this class of work.

A chapter deals with the toning of the positive film, and formulæ are given for both chemical and dye toning. The book is full of good advice for the production of the cinematograph picture, and will commend itself to all workers in this direction. The volume is obtainable from the Librairie Dunod, 47-49, Quai des Grands-Augustines, Paris (VIe), price 32 fr.

PHOTOGRAPHS OF THE BANK OF ENGLAND.—A correspondent writes to say that the work of heightening the Bank of England is to be commenced this month, and that photographers who wish to secure a last negative of this world-famous corner of London should lose no time in securing an exposure.

New Materials.

Gevaert Ortho-Sensima Plate. Made by Gevaert Ltd., 115 Walmer Road, North Kensington, London, W.10.

PRODUCED particularly for use in the artificial light studio, this new plate may be confidently recommended as a high-speed negative medium, sufficiently colour corrected to allow of short exposures being given to this means of illumination. The speed of the plate is declared as genuine 500 H. & D., and it is certainly a very high speed indeed. The plates which Messrs. Gevaert, Ltd., have sent us for testing, have been exposed upon a variety of subjects, under varying conditions of lighting, and in every instance, the negatives obtained have been of extremely high quality. In one case, where an exposure five times that indicated by the prevailing conditions was given, a negative, perfect in gradation, and with full detail in both shadow and high light, was obtained, simply by diluting the developer with an equal volume of water. Another plate exposed upon a portrait lighted by five grains of flash-powder gave a perfect negative fully exposed, thus proving the great latitude possessed by these plates.

A notable feature of the Ortho-Sensima negative is its particularly fine grain, which is similar in appearance to that produced in negatives upon very slow plates. Yet there is no doubt about the high-speed of the plate. Exposure in the studio using half watt lamps totalling only 6,000 candle-power, and with a lens working at *f*/6, were reduced, in the case of bust portraits, to one second, and fully exposed negatives obtained. Another notable feature is the great immunity of the plates from halation. An exposure was made to a window admitting a full amount of daylight, for fifteen minutes at *f*/11 at mid-day during the past week and a negative obtained, which was absolutely free from halation. The plates, exposed under the conditions mentioned above, were in each instance developed in the pyro-soda developer recommended by the makers, but diluted with an equal volume of water. This dilution would not be necessary, however, in the case of a normal exposure.

As a plate for general use in the studio and also for the press worker, when light is bad or of a yellowish nature, the Gevaert Ortho-Sensima may be strongly recommended, while for at-home portraiture using the ordinary room lighting, or flash powder it is of great value.

POSTCARDS FOR CHRISTMAS.—Messrs. Kodak, Ltd., are supplying professional photographers with a very charming set of Christmas postcard designs. Bromide cards are printed on the front, with suitable greetings and illustrated with really good black-and white Christmas drawings.

PASSE-PARTOUT BINDING PADS.—The chief difficulty in the making of a real and attractive passe-partout frame has always been experienced in getting narrow edges of binding upon the glass, and all of equal width. This difficulty may now be overcome by the use of the binding placed upon the market by Messrs. W. Butcher & Sons, Ltd., Camera House, Farringdon Avenue,

London, E.C.4. This binding has a carefully ruled impression along its entire length, 3 16th inch from one edge. This gives the correct proportions for the fold, and will therefore ensure each bound edge of the frame being of equal width.

The binding is made up in three lengths, viz., 8½, 10 and 12½ inches, and is supplied in pads perfectly flat and ready for use. The larger illustration shows a complete pad, and the smaller, a strip detached and folded. The binding is made in five colours, black, brown, oak, green, and havannah, each of distinctive surface texture. Three pads of strips, one of each length, are supplied in a neat card box. The price per box which includes directions for using the strips, is 1s. 6d.

CHRISTMAS CARD MOUNTS.—Messrs. John J. Griffin & Sons, Ltd., Kemble Street, Kingsway, London, W.C.2, send us a sample set of the Christmas mounts they are offering this year. The mounts are all of the up-to-date, double and triple folder types, with tasteful designs and mottoes embossed on the front cover. The mount illustrated is No. 102, which is supplied in grey, brown and white, the holly and seal design being in colours.

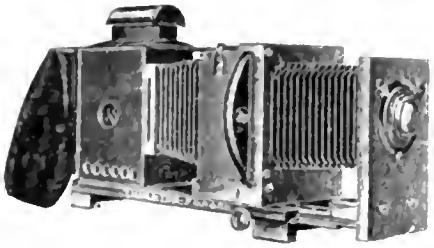
These mounts are cut from strong, well-made board and are extremely well finished. The whole series, which includes thirteen varieties, are, with one exception, intended for postcards, and either oblong or oval openings are provided. The exception is No. 269, which is intended for sketch portraits, and is so embossed. A particularly distinctive mount is No. 249, which has a brown embossed seal upon the front cover with the words "Best Wishes" inscribed in white. A gilt deckle-edge to the cover completes the

design. Sample sets of these mounts, comprising the whole range, are supplied upon application to Messrs. Griffin for the sum of 2*s*., post paid. It is hardly necessary to mention that orders and inquiries should be sent in as early as possible, to prevent disappointment as the supply is limited.

New Apparatus.

The Imperial Enlarging Lantern. Made by the Thornton-Pickard Manufacturing Co., Ltd., Altrincham.

A NEW model of enlarging lantern, to which the name of "Imperial" is given by the Thornton-Pickard Co., is one which it has been possible to place upon the market at a considerably lower price than has been charged during the last few years for this description of apparatus. As shown in the drawing, the enlarger



is externally of the customary condenser pattern, comprising a lamp house, pair of condensers, negative stage and bellows extension of the lens front. In certain details, however, the model represents certain new features. For example, a narrow stage is provided at the front of the lamp house for insertion of a sheet of ground glass, which is supplied mounted in a wooden holder for this purpose. The makers have also discarded the time-honoured system of mounting the condenser glasses in circular brass cells; instead, they provide a wooden box fitted with grooves into which the two condenser glasses loosely slide, one at the rear and the

other at the front of the box. The box is provided with a detachable and light tight lid, so that the glasses may be most easily and quickly removed for cleaning. The construction of the box, moreover, allows of satisfactory ventilation. A simple pattern of negative stage is provided, consisting of a stout frame which is held in alignment by a spring board and can be moved by hand for raising or lowering the negative in the stage and also for giving it a certain degree of angular movement in the plane parallel to the surface of the condenser. A particularly good feature of the enlarger is the ample extension provided for the protection lens—namely 15 inches in the quarter-plate size. This allows of reduction being done with the enlarger, and thus provides a convenient method of making lantern-slides from quarter-plate negatives, when the whole subject is to be included in the lantern transparency. The lamp house is also movable for adjustment of the distance of the light from the condenser.

The enlarger is made in four sizes, fitted with condensers of 5½, 6½, 7 and 8½ inches diameter, designed to take quarter-plate, 9 by 12 cm., 5 by 4 (and postcard), and half-plate negatives, respectively. Without a lens the corresponding prices are :— £5 5s., £6 10s., £7 17s. 6d. and £8 17s. 6d. The enlargers are supplied with a portrait lens, or with an Aldis, Cooke, or Beck objective, the prices in the case of outfits which comprise a lens including also an orange cap for the latter.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, NOVEMBER 6.

Birmingham Photo. Art Club.—"Flashlight Photography." A. Dordan Pyke.
Bradford P.S.—"A Tour in Italy." G. Halford.
Dewsbury Phot. Soc.—"Pictures of Egypt." Alex. Keighley.
Forest Hill and Sydenham P.S.—"Odds and Ends." F. Coleman.
Glasgow and West of Scotland Amateur P.S.—"Bromoil." D. L. Taylor.
Kidderminster and District P.S.—"Psychology in the Studio." C. P. Crowther.
Southampton Camera Club.—"Past and Present Methods of Making Photographic Lenses." W. B. Appleton.
Wallasey Amateur P.S.—"Portraiture" (Artificial and Flashlight).
Willesden P.S.—"Elementary Photomicrography by Simple Means." Dr. G. H. Rodman.

TUESDAY, NOVEMBER 7.

Royal Phot. Soc.—Presidential Address. W. L. F. Wastell.
Birmingham Phot. Soc.—"The Gunpowder Plot." W. A. Clark.
Exeter Camera Club.—"Practical 'Tri-Colour' Photography." F. G. Tutton.
Hackney Phot. Soc.—"Pin-hole Photography." S. G. Dyer.
Leeds P.S.—"The Fenland and Marshland Churches of Lincs., Norfolk and Cambs." E. S. Maples.
Maidstone and District P.S.—"A Loon in London."
Manchester Amateur P.S.—"The Making of Portraits." C. P. Crowther.
Manchester Amateur Phot. Soc. "The Making of Portraits." C. Pollard Crowther.
Morley Amateur Phot. Soc.—"Various Tones on Self-toning Paper." H. Walsh.
Nottingham and Notts P.S.—"After-treatment of the Negative." Miss Flemming.
Portsmouth C.C.—"Lenses—their Construction, Manufacture, etc." W. B. Appleton.

WEDNESDAY, NOVEMBER 8.

Croydon Camera Club.—Annual Dinner.
Birkenhead Photo. Assoc.—"Bromoil." J. MacSymon.
Borough Polytechnic P.S.—First Lantern Slide Competition.
Partick Camera Club.—One Man Show. J. B. B. Wellington.
Photomicrographic S.—"Pearls; and Pearling Life." T. H. Haynes.
Rochdale P.S.—"Across France to the Pyrenees." Butcher & Sons.
South Suburban and Catford Phot. Socs.—"A Method of Working-up the Print." J. J. Butler.

THURSDAY, NOVEMBER 9.

Coatbridge Phot. Assoc.—"Composition." A. M. Kerr.
Gateshead and District C.C.—Jumble Sale.
Hammersmith Hampshire House P.S.—One Man Show. R. Chalmers.
Kinning Park Co-op. Soc. C.C.—Contact Print Competition for Beginners.
Letchworth Camera Club.—"Old Baldock." Cannon & Brown.
North Middlesex P.S.—"Novel Toning Methods." J. H. Harris.
Richmond Camera Club.—"Development." W. H. Withey.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held on Friday, October 27, Mr. W. L. F. Wastell in the chair. Dr. G. H. Rodman delivered a lecture entitled "Familiar Flowers in Monochrome," illustrated by many excellent slides.

Dr. Rodman said he had to apologise for some of his slides, if the masking did not follow the present day idea, as many of the slides were made 20 to 25 years ago. After showing a number of slides of well-known flowers, Dr. Rodman spoke of the difficulties experienced in photographing orchids in the hot-house. He described this branch of flower photography as the most sporty of all. To enter a hot-house with a temperature of 120 degrees was to obtain much condensation of moisture upon one's lens. But this was not all; the Turkish bath effect given by even a short sojourn under the focussing cloth called forth much unparliamentary language. A slide which was well received, and one which Dr. Rodman said the ladies knew well, was that of the parasitic plant viscum album, commonly known as mistletoe. The arbutus unedo, or strawberry tree, was another interesting subject. Its name was derived from unum edo (I eat one), which Dr. Rodman said was quite correct, one being quite enough on account of the objectionable taste. The appearance of one of the saxifrages upon the screen must have delighted the chairman, who had previously said this was his line of defence when asked to name a flower.

Dr. Rodman, in concluding his lecture, which must have delighted the flower lovers and botanists in the audience, said that much interesting work was to be done in the photography of flowers, either *in situ* or in the studio.

A vote of thanks was proposed by Mr. Wastell, who said he found his botanical knowledge was better than he imagined, as he (the chairman) knew the name of every flower shown on the screen before Dr. Rodman mentioned it. Dr. Rodman, in reply, said that the audience should also thank the lanternist, Mr. Goldsmith, who performed his duties excellently throughout the lecture season.

Meeting held Tuesday, October 31, the President, Mr. W. L. F. Wastell, in the chair.

Mr. W. B. Appleton, of Messrs. Taylor, Taylor & Hobson, Ltd., delivered a lecture entitled "Past and Present Methods of Making Photographic Lenses." Speaking of the methods of lens making, Mr. Appleton said that at the time of his apprenticeship at Leicester lenses were made by methods very different from those in use at the present time; the work in the old days was in no way as congenial as it is under the present conditions, using highly scientific machinery. Before the advent of mechanical lens making it was necessary to obtain the optical glass in sizes as near as possible to the lenses which were to be made, and these pieces of glass were roughly cut into discs by means of a pair of scissors-like instruments called shanks. When a number of discs had been cut these were cemented together to form a roll, and were then shaped on the outer edges until the roll was perfectly cylindrical. The glasses were then separated and individually ground upon each face to the requisite curvature. The tools used were of a very primitive nature. One instrument for shaping the glass, shown by the lecturer, was merely an old saw file hardened and pointed. The next process was to affix a number of ground lenses to a metal holder, by the aid of pitch, and these were ground by hand, using a metal shell lined with pitch or wax. Rouge and water was continuously poured over the surface of the glasses which were revolving rapidly, while the operator continued to move the shell in various directions until a perfect polish resulted. Mr. Appleton had on exhibition a specimen of moulded optical glass in the form of a lens, but he said this method of manufacture was not suitable for high-class lenses, and was used chiefly in the form of condensers for lantern work. Coming to the modern method of lens making, Mr. Appleton said that it was now possible to obtain optical glass in fairly large slabs, which could be cut to the desired size by simple means. Before attempting to cut the glass, however, it was carefully polished on each side, so that the optician could examine carefully the actual construction of the material. Faults such as striæ and large bubbles could then be detected and the glass cut to avoid them. Special qualities were required in optical glass, qualities which were not found in the usual plate-glass used for windows, etc. The refracting and dispersing powers of optical glass had to be carefully adjusted, and in these respects optical glass differed entirely

from the usual type of glass used in other manufactures. Bubbles in the glass, which sometimes are found in high-class lenses, were usually very small and had no deleterious effect upon the image produced. In fact, the appearance of small bubbles was to some extent a hall-mark of quality, inasmuch as they proved that the glass had not been overheated before annealing. The cutting of the block of glass was then explained, and the soft-iron disc with small saw-like teeth filled with diamond dust, used in this operation, was exhibited. The glass was then subjected to the work of the disc cutter. This tool, also of soft iron with teeth filled with diamond dust, was of hollow cylindrical shape and was affixed to a drill-like machine which drove the disc through the glass. A method adopted in the manufacture of the cheaper type of lens was explained by Mr. Appleton, who showed a special patented shape block of glass, which allowed of the maximum number of discs being cut from it, with the minimum of waste. The disc was then attached to an ingenious tool of lathe-like construction, and the surface made either concave or convex by means of grinding with special wheels of carborundum. The method of obtaining convex curves of greater or less curvature was ingenious to a degree and eminently demonstrated the great advance which has been made in this direction. The machine for polishing lenses was then explained, and by means of lantern slides the lecturer pointed out the improvement of this upon the old method, while the moistening of the glass was carried out under more hygienic conditions. To test the actual curvature of the surface gauges as used in the older methods were not sufficiently accurate, and at the present time a proof glass was made of corresponding yet opposite curvature, and the lens being manufactured was adjusted to this. The well-known method of obtaining interference colours (Newton's rings) was used for ascertaining the accuracy of the work. A specimen shown was stated to have 1/50,000th of an inch air gap between the surfaces. A very graphic demonstration of the theory of interference was given by Mr. Appleton by the aid of a lantern polariscope, the colour bands in two lenses and also in a soap bubble being shown upon the screen. After polishing, the lenses were accurately centred, and then were ready for mounting in the usual brasswork.

Speaking of metal work, Mr. Appleton said that tubes, flanges and screws for lenses were made to limit gauges, which allowed no more than 1/1,000th of an inch error.

In conclusion, the lecturer put several slides upon the screen showing the different types of machinery used, and also an interesting slide demonstrating the method of centring the lens before grinding the edges. Several Cooke lenses were exhibited, including the "Primoplane" and "Aviar," two well-known types, and also the special cinematograph lens of an aperture of *f*/3.1. Some interesting photographs were upon view which were taken during the first Arctic Expedition. The Cooke lenses were found specially suitable for the extremely cold climate, there being no cement between the glasses.

On the proposition of Mr. W. B. Ferguson, a very hearty vote of thanks was accorded to Mr. Appleton for a lecture as lucid as it was interesting.

CROYDON CAMERA CLUB.

The august Council having deliberated regardless of the effluxion of time prior to last week's meeting, loud cries of "Red-time" greeted the President on his rising to usher in Mr. N. Moody on "Mounting and Finishing Prints." It was his first appearance as a demonstrator, and in quiet, unpretending fashion he made good.

Dry-mounting with an electric flat-iron formed the main theme, and those who might find the subject too dry, he remarked, would discover an obvious antidote close at hand. No difficulty had been experienced in mounting prints up to 15 x 12 on the thinnest of mounts, but adhesive tissues which answered well with machines did not necessarily work kindly with a flat-iron. He had found the "Victor" tissue to be the best for the latter. He had also found that a flat-iron worked better than some of the small mounting machines on the market designed for the use of amateurs.

The second part of the demonstration dealt with working up and spotting bromide prints. The lecturer once knew a teacher at an Art School who never could acquire the art of spotting without a full record of the operation, and another young lady, an apprentice to a photographer, at the end of six months had only learnt how to nibble the end of the brush. A good brush, and one not too small was essential. Spotting brushes sold by photographic dealers were to be avoided at all costs. The size known as "small goose," set in quill, as supplied by artist colourmen, answered admirably, provided the point was right. Pleading faintness, a glass of cold water should be asked for, and the brush tested by dipping it into the water and then bringing the hairs sharply over the edge of the glass. If they sprang back to a point (the point consisting of all the hairs, not a few) then it might be regarded as eligible for a second test, which consisted of spraying the hairs over the thumbnail and again examining the point. On an average, ten of such tests would discover one suitable brush. He made no mention of the attitude likely to be adopted by the assistant whilst this patient research work was being conducted.

The demonstration concluded with an exposition on colouring photographs in pastels and oil colours, and many striking and cheerful studies were passed round, of a kind bound to enliven the dullest apartment. The great advantage of oil colours, he said, was that they could be almost entirely rubbed off again, a gratifying feature not taken advantage of by the lecturer in the pictures shown.

In the discussion nothing definite could be extracted from Mr. Moody on how to gauge the right degree of heat of the flat-iron. "One soon learns," he remarked. Mr. Jobling said if half-a-second's dwell on the skin of the hand was possible, the temperature was about right. He had often employed a billiard iron with satisfaction; its rounded corners prevented development of lines. The President (Mr. John Keane) said he had recently spoilt one of his best bromoils by attempting to dry-mount it before it was quite dry. Many expressed a strong wish that he would repeat this procedure on every available occasion. A hearty vote of thanks was accorded Mr. Moody for a practical and very useful demonstration.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

An adjourned meeting of Council was held at 48, Baker Street (the president's studios), on October 19. Present:—Messrs. Marcus Adams, Angus Basil, Gordon Chase, Alexander Corbett, C. F. Dickinson, W. E. Gray, George Hana, W. H. O. Wedlake, and the secretary (Mr. Alfred Ellis). Mr. Corbett (president) in the chair.

The secretary reported the receipt of various letters on co-operative advertising, and, on Mr. Wedlake's proposition, these were referred to the appropriate sub-committee.

A letter was read from a member asking for advice as to payment in the case of some local views taken for a large firm for postcard reproduction. It was decided to put in the "Record" a warning to members that in taking photographs of local events, etc., for outside people they should get a proper understanding beforehand as to what it was proposed to do with the pictures and to what extent reproduction rights were claimed.

A member wrote asking whether a contract which he had made with a firm of advertising contractors could be amended. The contract was for a show case at a station some miles from his studios, and, the advertisement proving unremunerative, he desired to have it shifted to a more promising locality. He was, however, under a five years' contract to have it at that station, and his applications had been refused. The secretary wrote to the contractors and got the matter adjusted satisfactorily.

A letter was read raising the question whether a photographer was liable to pay unemployment insurance in the case of a woman cleaner of a studio who also did domestic work in the house. Beyond cleaning the studio, the woman in this case was not employed in any part of the photographic business. She was paid for by her employer under the unemployment scheme until March, 1922, when, seeing a statement in the press that employees of this class were not entitled to benefit if unemployed, the employer wrote to the Ministry of Labour, who replied that the applicant was an insurable person, and refused to refund. The letter was handed to the Association's solicitor, who stated that the Unemployed Insurance Act of 1920 did not apply to domestic service unless the person was so employed in a trade or business carried on for the purpose of gain. The fact that the person in this case had to keep the studio clean could not be said to make her an employee in the photographic business. Upon a similar point an application was made to Mr. Justice Roche, on June 13, 1922 (Wilkinson's application) in which a charwoman had been employed to clean a solicitor's office, and the judge held that she was employed in domestic service, and not in the business of the solicitor, and was, therefore, not insurable. The member who had raised the question, on having transmitted to him the solicitor's opinion that the woman was not insurable, promised to let the secretary know the outcome of events. Should the outcome be at variance with the solicitor's opinion, the secretary was instructed to press the matter further.

Another letter raised the question of Canadian copyright. The correspondent was advised before sending valuable work to Canada

to find out what protection there was against piracy, and on inquiry at the offices of the Canadian Government the secretary learned that the Canadian Copyright Act, 1921, was very similar to the British Copyright Act, 1911, save that certain registration clauses were inserted, whereby a print to be copyrighted had to be registered in Canada for protection at a cost of two dollars per subject.

Another correspondent referred to the need for a regulation size for passport photographs, some of his clients saying that his were too small, and others that they were too big. It was stated that there was no regulation size, but the experience of members of the council was that a size about 2½ by 1¾ in. elicited no complaints.

A member wrote as to a contract for certain postcards into which he had entered with a wholesale house, and which afterwards he wished to annul. The firm held him to his contract, or the payment of the gross profit of the transaction, together with certain damages for non-fulfilment of the contract. The solicitor's opinion was that the party having sent an order for the goods had entered into a binding contract, and that if an order was given and was afterwards repudiated, the injured party could claim, not the net profit on the goods but the gross profit. On the intervention of the secretary, who spent considerable time and much tactful diplomacy over the matter, the firm, whose original claim was for £11 10s., agreed to settle for £6 1s. The council expressed the view that the secretary had dealt with this case in a very able manner.

A member of council brought forward a case in which one of his photographs of a child had been reproduced, without permission or acknowledgment, as a sketch in an advertisement in a London daily paper. When the matter was first brought to the attention of those responsible it was argued that it was not an infringement of copyright because it was a line drawing, but the identity in every detail between the sketch and the original photograph was so complete as to make any suggestion that the first was not a copy of the second wholly untenable. The defence then was that the photograph from which the sketch was made was one in a book called "The Child in Art and Nature," which had an ambiguous foreword from which it might appear that any photograph therein could be copied.

A letter from a correspondent was read suggesting that a permit be issued for photo-canvassers, so that the police would know they were not fraudulent. It was agreed that this was not a matter for the council of the Association. Another member wrote complaining of unfair press competition at local events, when press photographers were welcomed, but their photographs were afterwards sold as prints and not merely reproduced in the press. He was advised to endeavour to come to an arrangement with the newspapers to do the work himself, receiving a small fee for reproduction, and reserving the right to take and use any photographs for sale.

Other correspondence dealt with by the secretary showed that he had advised on the matter of income-tax claims, charges for certain special work, infringements of copyright, costs of electric-lighting, studio construction (most painstaking advice being given in this instance, even to the drafting of plans), and the securing of a larger discount from a certain firm of dealers.

Commercial & Legal Intelligence.

NEW COMPANIES.

Pacific and Atlantic Photos, Ltd.—This private company was registered on October 18 with a capital of £1,000 in £1 shares. Objects: To carry on the business of photographers, manufacturers of cameras, stereoscopic and photographic apparatus and parts and optical goods, manufacturers and preparers of chemicals, plates, films and papers, etc. The subscribers (each with one share) are: A. O. Warren, 14, Bedford Row, W.C.1, solicitor; R. G. Clark, 125, Brecknock Road, N.19, solicitors' managing clerk. The first directors are not named.

Gilchrist Bros., Ltd.—This private company was registered on October 20 with a capital of £8,000 in £1 shares. Objects: To acquire the business of process engravers carried on by C. W. Gilchrist at Queen's Place, Claypit Lane, Leeds, as Gilchrist Bros. The subscribers are: C. W. Gilchrist, Glen Athol, Davies Avenue, Roundhay, Leeds, photo process engraver; H. Wright, 8, Moor Park Mount, Leeds, manager. C. W. Gilchrist is permanent governing director, subject to holding 100 shares, with £1,000 per annum as remuneration. Qualification £100. Secretary: J. A. Braithwaite.

Denton & Co., Ltd.—This private company was registered on October 17 with a capital of £2,000 in £1 shares. Objects: To acquire the business carried on at 36 and 38, Sheffield Road, Barnsley, as Denton & Co., and to carry on the business of photographers, photographic printers and photo lithographers, picture framers, manufacturers of and dealers in photographs, pictures, works of art, etc. The permanent directors are: G. H. Denton, 132, Park Grove, Barnsley; H. A. R. Denton, "Woodbury," Beech Grove, Barnsley (photographers). Qualification: 500 shares. Remuneration as fixed by the company. Registered office: 36, Sheffield Road, Barnsley.

News and Notes.

Colouring Lantern Slides.—Some months ago we reprinted from "Photo-Era" an article by Dr. Marcus D. Lovelace, on colouring lantern slides. The instruction given in the use of oil colours recommended itself so strongly to Messrs. Winsor & Newton that they have reprinted the article as a circular, in which also are given the prices for oil colours, brushes and stumps suitable for the colouring of lantern slides. A copy of the leaflet will be sent free on application to 37-40, Rathbone Place, London, W.1.

Photostat Machines.—Messrs. Alfred Herbert, Ltd., Coventry, England, ask us to correct the statement recently made in reply to a correspondent that the Photostat machines are supplied by the Kodak Company. Messrs. Herbert are sole selling agents, in practically all parts of the world, for the Photostat Corporation of Rochester, New York, and also are the sole agents for the supply of Photostat paper used in the machine. Mr. Littlefield, who acts for Messrs. Herbert in the selling of the machine in the London district, occupies rooms at the rear of the Kodak premises, at 40, Strand, London, W.C.2.

The Club Photographer.—The November issue of the "Club Photographer" obtains the staple of its contributions from members of the Exeter Camera Club. Dr. C. Beauchamp Hall writes on pictorialism in landscape, and Mr. F. Walker, in some notes on composition, describes a novel scheme for marking the ground glass as an aid to artistic composition. Mr. F. G. Tutton gives working details of the method used by him in making the three-colour transparencies shown at the recent R.P.S. exhibition, a contribution which we reprint on another page in the "Colour Photography" Supplement.

Photographing Fire-Flies and Glow-Worms.—The American scientific papers contain details of some interesting photographic experiments made by Dr. Herbert E. Ives, of Philadelphia, for the purpose of testing the illuminating power of fire-flies and glow-worms. Panchromatic plates were used for most of the experiments and exposures of one hour given. The insects, it appears, give a "flash" of about .004 candle-power, but the colour of the light given out is very different from ordinary illuminants; it is practically a monochromatic yellow-green. The complete paper, fully illustrated, may be found in No. 1,160 (Vol. 194, No. 2) of the "Journal of the Franklin Institute."

Postal Charges—From our own experience in the receipt of many letters daily, it would seem that there are a great many people who fail to realise the comparatively small weight of letter which can now be sent for the minimum three-halfpence. When the postal rates were reduced some time ago the maximum weight of a letter bearing a three-halfpenny stamp was reduced to one ounce. A one-ounce letter is quite a small weight in the hand, and our experience leads us to caution photographers as regards full pre-payment of letters addressed to their customers. Nobody can be expected to be favourably impressed by a letter drawing attention to So-and-So's portraiture if he has been surcharged a penny before obtaining possession of it.

Cinematographic Photographs by Wireless.—A Reuter telegram from New York states that moving pictures with the nearest film machine 1,000 miles away are promised by American engineers, who say they can transmit photographs by wireless. Members of the Society of Motion Picture Engineers, who met at Rochester (New York) last week, stated that the broadcasting of moving pictures by wireless has been successfully demonstrated. It was said that from a central broadcasting station films can be sent out by wireless so that a receiving set in communication can project the picture straight on to the screen as it is issued. There will no

longer be any need for projection machines and operators if the invention is successful. A wireless receiving set will replace them all.

ELECTRIC CURRENT AT POWER RATE.—As we go to press the hearing is imminent in the Court of Appeal of the application by the Wykeham Studios, for the setting aside of the judgment some months ago by Mr. Justice Swift, in the action taken against the Wykeham Studios by the Westminster Electric Supply Corporation, Ltd. Mr. Justice Swift held that current consumed in a studio arc lamp was current for power purposes, but he also held that the electric company was justified in charging a rate higher than that charged to other consumers of current for power purposes though lower than the full lighting rate. It was, no doubt, against this part of his judgment that the Wykeham Studios appealed. It is hardly possible that the decision of the Court of Appeal will be given in time for even brief mention of it in this issue, but most probably judgment will be delivered in time for a report to appear in our issue of next week.

SCOTTISH PHOTOGRAPHERS' GOLF.—The return golf match between the Glasgow and District Professional Photographers' Golf Club and the Edinburgh Society of Professional Photographers took place on the course of the Bruntsfield Club at Davidson's Mains on Friday, October 20. The match was played in foursomes, and the Glasgow players proved their superiority by winning every match. In the evening the visitors were entertained to dinner at the Haymarket Restaurant, under the chairmanship of Mr. J. R. Coltart. After dinner was served the toast of The King was duly honoured. Other toasts followed, and the health of the Glasgow players was enthusiastically drunk by their opponents. Mr. Coltart presented the cup to the winning team. The thanks of the company were extended to Mr. George Balmain for carrying out the arrangements for the day's outing and for the dinner, both of which had been an unqualified success. The company, after singing Auld Lang Syne, adjourned to the station, where Mr. Coltart kept up the fun until the train left.

BRITISH PROFESSIONAL PORTRAITURE.—Writing in "Abel's Weekly," Mr. Pirie MacDonald has some strong words of commendation for the British portraiture shown in the recent P.P.A. Congress exhibition, and urges his American brethren to do better another time. He says:—The British division was to me remarkably in advance of any British professional show I have ever seen—dozens of good things—almost every one of straightforward photography—of good control and few tricks, but very honest portraiture. The first prize went to a charming piece by the Mesdames Morter, which was by long odds the best piece of the section, but as a whole the British had every reason to feel "cocky" over the demonstration. The American section by comparison quite fell down. The work seemed small and slick—very different from the German failure—but nearly as bad in another way. The portraits were not convincing; they lacked the feeling that the people were portrayed but rather that the photographer had done a neat, quite pretty job. Of course, I can't mention names—it is not fair to criticise adversely exhibits that were sent by men who believed that they were doing the right thing, but it is true that many of the men who sent pictures would have been bitterly disappointed if they had seen their work on the wall. Pretty nearly the whole of the American exhibit seemed as though it was made of pictures that had sold—pictures that had sold because the sitter had been pandered to—pictures that were made for money—only for money—with no sign of their having been made from the joy of making them. Alongside of the British show they seemed commonplace and as a whole insipid—over-retouched—over-tickled—good negatives spoiled because the subject wanted to look pretty or young, in other words they lacked "guts." I feel that an exhibition of that kind should be the place where a man would send the things that he really believes in—his ideals and not his commonplaces—the things that he would prefer to make rather than the things that he is forced to make, for I do not conceive that it is a disgrace to make for your customers what your customers want, but I do feel that a man is giving away his birthright if he does not from time to time persist in making those things which he would prefer to make. A show like the Professional Photographers' Congress of Great Britain is the place where a man has the opportunity, perhaps the sole and only opportunity, of showing what is in his heart, and in preparing his exhibit he has the opportunity of doing what he prefers to do. George Harris is going over next year as their lecturer, and I hope that we may send an American exhibit which will make him feel proud that he is an American when he sees it on walls in competition with the work of the world.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

COPYING HALF-TONES ON NEWSPRINT.

To the Editors.

Gentlemen, On page 660 of last week's "B. J." there is a reference to the work of copying half-tones from books and newspapers.

Some years ago I had a lot of this work to do, and after making many experiments I found that the best (dot-less) results were to be obtained by using a rapid plate, exposing fully, over-developing, and afterwards reducing the negative in a hypo-ferricyanide bath.

The full exposure and the over-development tended to close up the dots forming the high lights (in the original), while the reducer cleared away the dots from the shadow portions—or rather the spaces between the dots; anyway, little of the half-tone structure was visible.

How such negatives would serve for making lantern slides I do not know, but they gave the most perfect results on matt bromide paper.—Yours faithfully,

E. A. LEVY.

DARK ROOM LIGHT FOR BROMIDE PAPER.

To the Editors.

Gentlemen,—I am much interested in your correspondent's letter concerning the use of a red or yellow light for developing, etc. Has he, or she, ever tried the red and yellow together so that the light passes out through both? I have used this arrangement for a long time, and find it a perfectly safe one for plates or papers. Personally, I have no doubt that bromide papers can be exposed for a longer period under the combined red and yellow than they can under the separate colours, without fogging. The diminution of light can be easily remedied.—Yours faithfully,

E. J. FOSTER.

36, Lavington Road, Ealing, W.13, October 27.

Gentlemen,—With reference to your correspondent "Hyperion's" remarks on the above subject, while I can quite believe the results of his observations, I am afraid he has been led to a false conclusion as a result of them.

A red safelight only transmits the red rays, and a certain amount of the orange; an orange safelight passes the red, orange and yellow; and a yellow safelight the red, orange, yellow and green. These, of course, are only approximate statements, as I am not at the moment able to give the exact wave-lengths of the limits of transmission of standard safelights, such as those of Wratten and Wainwright.

It is obvious, therefore, that any material which is fogged by a red safelight is necessarily fogged by a yellow one, since the yellow safelight transmits all that the red one does, and more in addition.

I should therefore be surprised to hear of an experience such as "Hyperion's" with proper safelights, but many samples of "ruby glass" transmit quite an appreciable amount of blue or violet, and would be unsatisfactory for either plates or paper.

I think, therefore, it is very probable that "Hyperion" has used such a piece of glass and a yellow glass which absorbs the blue and violet more satisfactorily. Red sensitivity of the bromide paper would obviously cause it to fog in either a red or a yellow light.

The moral of "Hyperion's" experience would therefore appear to be that one should use a safelight of recognised quality and not rely on ordinary coloured glass.—Yours truly,

J. ARNGER HALL.

Imperial College of Science and Technology,
South Kensington, London, S.W.7.
October 29

To the Editors.

Gentlemen,—With the usual disclaimer, may I mention that, correctly used, the Wratten series of safelights provide a full margin of safety in the development of plates and papers? There

probably are other excellent varieties, but my own experience concerns this make only.

"Hyperion" seems to leave out the important question of intensity of illuminant, and a yellow, red, or green screen can hardly be expected to function correctly if, as I have seen used, a high candle-power electric lamp is employed almost touching the screen surface inside. These lamps, in my opinion, are entirely unsuited for dark-room lighting.

As a commercial photographer, I am at present using Wratten Series OO, yellow for papers, and II. for plates, illuminated by old type 8 c.p. carbon-filament lamps. These lamps are more suitable than the metal-filament lamps of equal c.p. Thus it seems that if the correct strength of light is used, placed well back from the glass screen, no unsafe "spot" can show itself. Supporting this, most of my prints (blocked out) showing pure white backgrounds never fog during normal time of development—two minutes at the most.

"Hyperion" refers to yellow being safer than red; whether or no this is the case matters little. The decisive factor rests, I think, with difficulty of knowing when the print has arrived at sufficient depth when using a red light for developing prints.

Many temporary contraptions used as dark-room lamps are badly designed, badly ventilated, and wrongly illuminated, so with light streaming on a white ceiling, in turn reflected on the print or plate, *plus* a melted gelatine screen through which almost white light emanates, fogging of plates and papers can only be expected.—Yours faithfully,

R. Beswick Willcock.

119, Roseneath Road, Urmston, Lancs, October 28.

To the Editors.

Gentlemen,—With reference to your correspondent's note that some bromide papers are more sensitive to red light than to yellow, I may say that it is possible to develop safely by a reflected yellow light extra rapid plates (non-colour-sensitive) which will be fogged by a red light of inferior visual brightness. The best working conditions are provided by time development with normal strength developer at a sufficient distance (variable according to the character of the yellow light, but generally never under 6 ft.) from the reflecting surface (wall, sheet of cardboard, etc.).

No doubt others also have noticed this peculiarity, which is probably due to those twins, "actinic value" and "visual intensity," as well as to the instinctive greater caution when a bright light is used.—Yours faithfully,

Louis Nell.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

Savoy Studio.—No agent in this country, so far as we know. For dyes, try Williams Bros. & Co., colour manufacturers, Hounslow, Middlesex.

W. H.—(1) Papers vary considerably as regards the facility with which they tone with liver of sulphur. The only advice we can give you is that you try one or two makes. (2) You can preserve pyro with citric acid, but it is a much inferior preservative to metabisulphite and less effective as regards preventing stain. We do not believe that there is any material which requires citric acid as a preservative of pyro.

J. C. R.—You require some form of bottom lighting, and we suggest, if electric light is available, that you instal one 1,000 c.p. lamp near the ground, and on the opposite side of your studio to the glass roof. Failing electricity, obtain a fairly large white reflector, and place it at an angle of about 30 degrees from the floor, and with one edge resting on the floor. This would reflect the light upwards, and so relieve the shadows under the nose and eyes.

C. W.— (1) For lens mounts and iris diaphragms write to C. Haseler and Son, Ltd., 94, Bridge Street West, Birmingham. (2) A stiff dextrine mountant would be very suitable for your purpose. White dextrine should be used, and 2 lbs. dissolved in 32 ozs. of boiling water. The mixture should be preserved by adding 10 minims of origanum oil, and the whole allowed to cool and set before use. The shellac mountant, mentioned in the "B.J. Almanac," 1922, p. 497, is also suitable.

J. F.—For glazing glossy bromide or P.O.P. prints, the glass or ferrotype plate should be rubbed over with the following mixture:—

1 oz. green soft soap of the British Pharmacopœia (obtainable from chemists).
15 ozs. methylated spirit.

Allow the soap to dissolve in the cold, apply to the plate on a piece of soft rag and polish off well before squeegeeing prints.

D. K.—There are two methods available for the photography of shop windows. One is to provide a large black curtain to fit to the awning blind, and which will reach across the full length of the window and hang down to about a foot from the ground. The camera is placed inside this, and a fairly long exposure at a small stop given. The other method is to make the photograph by night, using the ordinary window illumination for the lighting, a small flash being given fairly high up to illuminate the facia. The articles displayed in the windows should be placed against a fairly light background.

J. E.—The developer recommended in Freund's method of desensitising with potassium iodide is a special formula of hydroquinone and soda carbonate. The formula will be found on page 533 of the "B.J.," September 21, 1921. In your enlarger we should think the best method would be to fit your lens to a rack focussing lens tube, such as is used in projection lantern lenses. A tube of this kind could be obtained from C. Haseler & Son, Ltd., 94, Bridge Street West, Birmingham. If you send them the lens flange they could fit it securely to the focussing tube. You can obtain spectacle lenses from W. Heal, 58a, Hatton Garden, London, E.C.1.

N. P.—It is possible that the under-exposed patch on your negative is due to a spot of dust (or perhaps a fly) on the filter which was in front of your lens during exposure. The absence of definite shape proves that the object must have been some distance from the plate and possibly in front of the lens. If the plates had been touched during development, or if hypo had affected the plate, some more definite marking would have been the result. The fact that it did not occur again on any other plate proves that the cause was only a momentary one. While a half-plate negative is of better size than quarter-plate for contact work, we find that the extra weight is very much against the use of the former for hand-camera work. The majority of pictorial workers use the quarter-plate size, and some even smaller than this.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3262. Vol. LXIX. FRIDAY, NOVEMBER 10, 1922. Price Fourpence.

Contents.

SUMMARY.

In the Court of Appeal last week, before Lord Justices Bankes and Scrutton and Mr. Justice Eve, the appeal of Wykeham Studios, Ltd., against the recent judgment of Mr. Justice Swift was dismissed. The appeal concerned the rates which an electric supply company may charge for current consumed as power. The Court of Appeal has taken the view that a company may charge any rate up to the maximum lighting rate, and that any objection based on the protective sections of the Electric Lighting Act of 1882 must be made by the consumer, who must show that his consumption is similar in kind to that of others who are charged a lower rate. (P. 680.)

In a leading article we review the circumstances of the previous hearing and discuss what appear to us to have been the cause of the recent appeal judgment. (P. 674.)

In his article this week, Mr. J. Effel deals with the photography of hands and feet in the full-length figure, and specially emphasises the importance of study of hands and feet by themselves as a factor in studio portraiture. (P. 675.)

The Professional Photographers' Association has drafted a schedule for guidance in the fixing of charges for commercial photography. (P. 673.)

The question may be raised whether the larger accommodation at the Holland Park Hall in March next does not justify a re-assemblage of forces between the P.P.A. and the organisers of the Fair. (P. 674.)

In a recent communication from the Eastman Research Laboratory, Dr. S. E. Sheppard reviews the recent chemical work which has been done on the problems connected with the use of gelatine in the making of dry-plate emulsions. (P. 677.)

Mr. A. C. Banfield has recently described the method which he finds effective for diffusion of light in an enlarger, constructed without a condenser, for the minimising of graininess in the enlargements. He uses both opal and ground glass. (P. 674.)

At the Royal Photographic Society on Tuesday evening last, Mr. W. L. F. Wastell, in his presidential address, traced the development of the lantern slide from its pre-photographic days, and showed a very large number of slides prepared by different photographic processes. (P. 684.)

A correspondent draws attention to the light patch which may be caused on a negative by the flicking in front of the lens of the tassel of a roller-blind shutter. (P. 686.)

Dr. B. T. J. Glover, in a letter on page 687, gives particulars of the remarkable keeping properties of a metol-hydroquinone developer.

Lithographic methods for the rapid and cheap production of portrait posters are the subject of a contribution to "Photo-Mechanical Notes." (P. 681.)

A most admirable exhibition of pictorial landscape photography by members of photographic societies affiliated to the Royal Photographic Society remains open during the present month at 35, Russell Square. (P. 681.)

EX CATHEDRA.

The 1923 Almanac. Next year's edition of the "British Journal Almanac" is now well on its way to completion in the form in which it will be issued to the public, and, unless any unforeseen circumstances crop up, it should be published on or about December 1 next. As has been the case for many years past, practically the whole edition of 30,000 copies has already been ordered by dealers, distributors and shippers. Writing more than three weeks before the date of publication, it is reasonable to anticipate that no further copies will be obtainable from the publishers, Messrs. Henry Greenwood and Co., Ltd., by the time the books are on retail sale. We would ask that those who have not yet given a definite order for their copy to be reserved for them should note this announcement; otherwise, after publication, they may not be able to purchase in the ordinary way. The greater portion of the edition of the "Almanac" is ordered by dealers simply to the number of the requests which have been specifically received from their customers, and, therefore, in many cases, it happens that there are no copies for buyers who come in afterwards. We are anxious to make these facts clear, and particularly so since one or two London dealers a year ago ordered a greater number of copies than they had any reasonable expectations of selling, and of late have offered what were left at less than the published price. The incident is altogether exceptional, and steps have been taken to prevent its recurrence.

* * *

Charges for Commercial Photography. The Professional Photographers' Association has performed a useful work in codifying the charges which are made for commercial photography. Returns by a number of commercial photographers in London and the provinces have been obtained, and are averaged in a table which is published in the November issue of the Association's "Record." We are cautioned that the schedule thus obtained is copyright, and, although we have our doubts of its title to protection as a literary work, we have no wish to take advantage of a legal uncertainty, but will content ourselves with such extract as the Copyright Act permits us to make by way of fair and reasonable comment. The schedule sets forth the prices which may be taken as applying to a good standard of commercial work in sizes from half-plate to 15 x 12 inches. In the half-plate size the charge for taking a negative and supplying one print is 10s.; additional subjects taken at the same time, 7s. 6d. each. For further prints from a negative the charges are 2s. 3d. each, or 20s. per dozen unmounted; 2s. 9d. and 26s. if mounted. We are glad to see that an indication is given of the charge which should be made for delivery up of a negative which has been the subject of an order in the ordinary course. The price suggested is 12s. in the half-plate size. For

making and supplying a negative to order the figure is 18s. 3d. Messrs. George Hana and Jenkyn Griffiths, who have carried out the compilation, very properly dwell upon the difficulty of drawing up a table for hard-and-fast use. The quality of work is a highly variable factor to begin with; and it is suggested that prices, such as those we have quoted, may be reduced to two-thirds for work of medium grade or in quantity, whilst they may be doubled or further increased if special skill and attention are required on the part of the photographer. Extras, such as flashlight, working-up, orthochromatic photography, interior subjects, likewise make it difficult to establish a price-list which can be uniformly followed.

* * *

Fair and Congress. It is to be inferred from the necessarily brief references which have been made to the subject in their reports of council meetings that the Professional Photographers' Association have not yet come to a definite decision respecting the Congress which they will hold next year. Correspondence which we have published certainly indicates a balance of opinion in favour of a date for the Congress in March or April, and also its association with the Photographic Fair. We have no wish to influence the Association in any decision to which it may come, but, at the same time, the opinion may be expressed that two trade photographic shows in London in one year are inadvisable. Certainly the manufacturing and trading firms do not want two; and, from the standpoint of making the greatest public impression, there is no doubt that in 1923 more could be accomplished at a single trade exhibition than by dividing forces between the Fair and a P.P.A. trade show in the autumn. We imagine that the Holland Park Hall, at which the Fair is to be held, contains accommodation sufficient for the purposes of a Congress, and also sufficient for a display of professional portraiture. While the time between now and the Fair is rather short for bringing together a professional exhibit of the international character of that organised by the P.P.A. in September last, it does seem, in the interests of all concerned, that the possibilities of holding a Congress in the middle of March at the Holland Park Hall should at least be investigated.

* * *

Grain in Enlarging It is often found when making enlargements with the ordinary type of condenser lantern that effects are produced the graininess of which is quite out of proportion to the quality of the negative image. Retouching marks also show very badly and seem to appear more prominent than would be expected. This is due, according to a lecturer at the Royal Photographic Society, to the uncorrected aberrations of the system used; tiny diffraction circles surround each enlarged grain of silver, while retouching marks are paralleled on both sides with diffraction lines. Many efforts have been made to correct this defect, the simplest suggestion being to insert a piece of ground glass between the condenser and the negative. This minimises the defect, to some extent, but does not eliminate it altogether. Chiffon used in front of the lens softens the image considerably, but even with this extra softness the diffraction marks are not removed. The lecturer, Mr. A. C. Banfield, suggested a method which he has adopted with marked success, and which enables an enlargement to be produced entirely free from grain. The light is diffused by the aid of a piece of ground glass supplemented with a sheet of "flashed" opal, the condenser being discarded altogether. The ground glass should be considerably larger than the negative to be enlarged, and should be placed as near as possible to the source of light. A sheet of "flashed" opal is then placed in close proximity to the negative, but at a distance of at least four inches from the ground glass. The illuminant in this system of enlarging must of necessity be of fairly high power—a 15-ampere arc or 1,500 watt half-watt lamp is used. The lamps are so fitted that each may be used separately, and may easily replace each other. Owing to the large amount of heat given off by these lamps, it is necessary to provide some means of effective ventilation, and it was suggested by Mr. Banfield that the apparatus be fitted to an aperture in a wall separating two rooms. The lamps were then situated in one room, and the negative carrier with the camera and lens in the other. When enlarging from small negatives, *i.e.*, up to and including half-plate, the ground glass may be dispensed with, the opal giving an evenly-diffused light over the whole surface of the negative. It was pointed out that the "pot" opal type of glass was not suitable, as it absorbs far too much light, without any gain in diffusing power. A reflector helps considerably when used behind the half-watt lamp. But it should be of fairly large size, the "Barkay" reflector being recommended as very suitable.

CHARGES FOR STUDIO ELECTRIC CURRENT.

It will be remembered that in the early part of the present year action was taken in the High Court, before Mr. Justice Rigby Swift, by the Westminster Electric Supply Corporation, Ltd., against Wykeham Studios, Ltd., in respect to the charges for electric current used in a studio arc lamp by the defendant firm. The proceedings were reported very fully in our columns at the time.* Although the circumstances of the dispute are of importance to all photographers using electric current for purposes other than ordinary illumination of premises, they may, perhaps, have escaped the recollection of many readers, and, therefore, it is well that we should briefly recall them before proceeding to refer to the judgment given on Thursday in last week, November 2, in the Court of Appeal, by Lord Justices Bankes and Scrutton and Mr. Justice Eve, as the result of application by Messrs. Wykeham Studios for the decision of Mr. Justice Rigby Swift to be reviewed in the higher Court.

The Wykeham Studios, Ltd., had been supplied with current for their arc lamp through a separate meter at the ruling power rate, but subsequently the electric supply company charged first the full lighting rate and afterwards a rate less than this latter, but greater than the power rate which was charged at the same time to other consumers. The Wykeham Studios disputed the right of the electric company to charge such higher rates, with the result that they were sued in the Court for an amount which, it was agreed, represented the difference between the lowest power rate and the rate which was demanded from the Studios. The judgment of Mr. Justice Swift went against the defendant firm, for, while it was held that current supplied to an arc lamp in a photographic studio was correctly classed as current for power purposes, it was held, on the other hand, that an electric supply undertaking has the right to vary its charges for current for power purposes. In the hearing of the action a great deal of discussion ranged round the two sections, Nos. 19 and 20, of the Electric Lighting Act of 1882, which enforce uniformity in the terms of supply and prohibit preference to one consumer in comparison with another. In particular, the action turned on the application of the words "under similar circum-

* *B. J.*, 1922. May 19, pp. 297-298, and May 26, pp. 314-316.

stances," which are contained in Section 19. This section runs:—

> Where a supply of electricity is provided in any part of an area for private purposes, then, except in so far as is otherwise provided by the terms of the licence, order, or special Act authorising such supply, every company or person within that part of the area shall, on application, be entitled to a supply on the same terms on which any other company or person in such part of the area is entitled *under similar circumstances* to a corresponding supply.

As we pointed out in a discussion of the judgment, published in our issue of May 26 last, Mr. Justice Rigby Swift's decision appeared to have been based on an entire misapprehension of the circumstances in which current for power purposes is consumed by photographers. The learned judge said:—". . . . . the photographers, speaking generally, are not taking current for power purposes under similar circumstances to other manufacturers. Their lamp is not burning regularly and for fixed hours during the day or night, but is intermittently used as occasion necessitates for the taking of particular photographs." He appeared to assume that photographers use current in this intermittent fashion, and that other consumers of current for power purposes use it constantly, that is to say, at a regular rate and without intervals of disuse.

The Court of Appeal has now confirmed the judgment of Mr. Justice Rigby Swift, and Lord Justice Bankes, in delivering judgment without calling upon the respondents' counsel, set forth his decision in more explicit terms than was done in the lower Court. He agreed with the previous judge that current consumed in an arc lamp is current supplied for power purposes, having regard to the definition of power purposes. And he also held that the circumstances of the consumption were not similar to those of other consumers of current at a power rate and that the supply was not a corresponding supply. Indeed, he was, perhaps, more explicit than Mr. Justice Swift in taking the view that the circumstances under which power current is consumed in photographic studios are different from those on the premises of all other consumers of current at a power rate. Mr. Blanco White, for the appellants, had laid great stress upon the fact that no evidence had been forthcoming from the electric company in the previous action as regards the difference in the circumstances which justified the supply undertaking in charging a power rate higher than the minimum, and he argued that the onus of supplying such evidence was upon the electric company. Lord Justice Bankes, however, definitely took a contrary view on this point. He said, in effect, that an electric supply company under its powers may charge any power rate it likes up to the maximum lighting rate, and if a customer objects to the higher rate he must bring forward evidence to show that the circumstances of his consumption are not worse, from the point of view of the electric supply company, than those of other consumers of current at a power rate. In our opinion, after listening to the arguments and judgments in both the Courts, it is very likely that events would have taken a different course if this particular question of the circumstances of consumption, in comparison with those among other power users, had been fully investigated by the examination of witnesses in the first instance. It is unfortunate that in the lower Court the parties reciprocally agreed to certain matters; the fact that there was a vital disagreement regarding the circumstances of consumption appears to have been overlooked until it was too late to rectify the omission. In the absence of evidence, both Mr. Justice Swift and the Judges of Appeal appear to have made large assumptions respecting this question, which obviously is the crux of the dispute. It was taken for granted, with a readiness which seems astonishing when one bears in mind the meticulous accuracy which judges demand in other matters, that users of electric current for photographic portraiture come in a class by themselves on account of the highly intermittent use which they make of their current supply. Nobody, we suppose, denies that their use of current is intermittent; the question is whether it is more intermittent than that of other consumers obtaining current at the minimum power rate. It seems to us that such a question can only be answered by evidence of fact, and it is for that reason that we regret the absence of opportunity in the proceedings for the facts to be ascertained. Cases may perhaps arise in the future when similar conditions will be investigated in a Court of Law more closely in reference to realities. For the present, the effect of the judgment is perfectly clear. It is, that an electric supply company shall charge a power rate to users of current for studio portraiture, which rate may be anything from the minimum power rate to the full lighting rate. Also, according to the judgment, a photographer who objects to a charge which he considers excessive in comparison with that charged to other users of current at power rate is required to show that his consumption is similar in kind to that of others who are charged less than he is.

WITH A PORTRAITIST IN THE STUDIO.

[In the present paper of the series, which is being contributed by Mr J. Effel, the writer, in dealing with the photography of hands and feet in the full-length figure, lays special stress on the study of the posing of hands and feet by themselves. By so doing the portraitist will quickly recognise ugly poses of these parts of a full-length portrait. Mr. Effel gives some homely examples of methods which may be used in training the eye to sensitiveness regarding the position which hand or foot may occupy in a portrait.]

X.—HANDS AND FEET: THE FULL LENGTH.

Other times, other manners, George, as the French put it. The last time I was in Paris I visited an art school where formerly I had studied. I found myself regarding a full-length drawing at which a young pupil was working. The sketch was proceeding on lines totally different from what I might call the traditional South Kensington method of thirty years ago. The paper seemed covered with squares, crude triangular figures, and other shapes which were used as guides for the different parts of the figure. What surprised me most was that after getting those shapes to his satisfaction—and to the satisfaction of the very exacting master—a foot or a hand, or whatever took his fancy, would be finished without the faintest reference to the whole. Of course, a moment's reflection ought to have proved that if the skeleton forms were right in shape and proportion the details of the parts were bound to join up and match perfectly, but, as I say, it was new to me.

Now we are not going to discuss different methods of teaching drawing, but whatever criticism might be levelled against the system I have outlined, there can be no doubt that a portrait photographer must be able to photograph satisfactorily the head, hands, feet, and other parts of the human

figure, as viewed from all angles, and in different attitudes, before he can hope to produce full-length pictures of any worth. It is as preposterous to attempt a picture full of problems, without previous study, as it would be presumptuous of the young musician to attempt a difficult rhapsody of Liszt before he had, in practising scales and chords, mastered the details of which the intricate composition was built up. When we started these lessons, George, our first consideration was the bust portrait. We have gone over a good deal of ground, and I have been pleased to see that my lessons have borne fruit by the experimental plates you have exposed. You have now blotted out from your life the meaningless two-eared front face, the hall-mark of the ignorant dud. You are using far less light than formerly, and your "modelling" has gained enormously. Where I still see faults—and, rest assured, my lad, I'll point out every one—in selection and treatment, they are entirely due to your lack of knowledge. Without wide knowledge, or extraordinary genius, experimenting is largely a waste of time. While, then, in the finer points of head and shoulder work you are not well enough instructed to enable you to go much further, you possess a good working knowledge of the posing and lighting of the top end of a full length. In our three-quarter length experiments you have seen me working for different effects with the hands, and you have heard me lecturing about the placing of the feet. But beyond vague generalities, I have not imparted to you sufficient knowledge of the possibilities in photographing hands and feet; I have never even mentioned "the dignity of the human spine," the legs and arms in straight and curved effects regarded from the æsthetic rather than from the anatomical aspect, and the modifying part played by clothing. The student of portraiture should always have at the back of his mind the consideration of the nude. Leighton, I believe, worked from the nude figure and then superimposed draperies, through which one could discern the lovely forms underneath. Certainly in the rhythm of his draped figures there is a great lesson for the portraitist. I am not about to suggest that a photographer could work on the method of Lord Leighton, yet the covered limb must always be regarded *as* a limb, and the old question put to ourselves: "Shall I disclose, or shall I hide?"

Dress is of two kinds, that which shows off the figure it covers, and the other sort, which is purely decorative or fashionable with but little reference to the form of the wearer. The hands are usually uncovered, so we will consider their treatment first in the building up of full-length portraits.

I remember the late Wilson Barrett saying that even as an old and experienced stage performer he was frequently at a loss as to what to do with his hands. How much more difficult, then, must it be for the ordinary man or woman who has never given a thought to deportment, and for the photographer who is suddenly called upon to make a graceful portrait out of such unpromising material. There are two ways of meeting the case: the hands may be hidden, or the portraitist must know thoroughly what to do with them. Let us think of the latter way. Even the hiding of the hands skilfully requires a little knowledge. The difficulties with the hands are usually that they are too big, and in a photograph have the knack of looking more awkward still, the customary rendering being of the "Mutt and Jeff" school.

I want to make it quite plain to you, George, that a photographer is considerably handicapped when his work is compared with that of the painter, particularly when a short focus lens is in use. For that reason there are attitudes and effects quite in common practice with painters utterly impossible with the camera. You remember in the early days of the war a poster of Lord Kitchener pointing a finger straight out of the picture. It was an arresting bit of work, but no photographer could have produced it. Another point to remember in this connection is that far more retouching, faking, and idealising is possible with the man who works with pencil than with the camera artist. So that when the camera tends to increase the size of the hands when they are slightly in advance of the body the photographer must know how to make them appear neat.

By what means can we make a large object look small? Assuming the same distance from the lens, I cannot see how the proportion of a football to other objects in a picture can be altered, but most objects other than the spherical have many different shapes when viewed from different angles. Take the ordinary household plate—you'll find one somewhere about the printing room; just bring it here, George, and we'll have this matter out. Hold the plate full front face to the camera—thank goodness, a plate hasn't ears!—and we have a perfect circle. Now hold it out, showing its profile. Close one eye—always remember your camera has only one—and look at the edge. Little but a narrow line is now visible. That plate is approximately 8 in. in diameter, and it would require a box 8 in. square to hold it flat. But when you think of the side face of the article you will see that 8 in. by 1 in. is its size, sectionally regarded. Tilt the plate a little, George, and you find that the round object appears as a more or less attenuated oval, and when you get round to the three-quarter view you will find disclosed, in addition to the oval of the business side, another set of contours at the back. Well, George, if so much variety can be got out of the common or breakfast plate, surely the human hand should not discourage us.

Lay down the plate, George, but keep the little demonstration in your mind. Now hold your hand out before you in a similar position to the view of the plate at its biggest. We are looking at the palm of your hand, and the fingers and thumb are close together. It looks as stiff and solid looking and as devoid of the sense of movement as we can show it. Except that we know differently, the hand might stick out at the back for inches, indeed conjurors can either "palm," or hide behind the hand comparatively large objects, when showing the reverse side square on to the audience. Bear with me, George, and you'll see the point presently. You remember my strictures about the front face. Well, the same remarks apply to the hands. A photograph should tell the story of the form of the sitter. In a full length portrait, in what the English call the tout ensemble (and the French call something else), the more of the physical and facial characteristics unfolded, the more faithful the likeness. Cromwell notwithstanding, I have no great predilection for featuring warts on strong silent men or knuts trying hard to be different (by being like somebody else) under the impression that I am rendering "character." History is silent concerning the reply of the artist to the Protector. Had I been in the painter's place, my sitter would not have had a walk over. I would have said to him, "Oliver, old onion, your theories of government may be all right, but you're off the rails about art. Here I have brought my great genius to bear upon the problem of rendering immortal the real Cromwell, as faithfully as my exceptional training and talent in the use of pigment can convey to the world what manner of man you were, how every trait of your character was etched deep into your face by your own strong convictions, and now you come this fool talk about warts. This was decidedly a thing for an artist to ignore; *a wart has no character, and might as easily disfigure the face of a fathead as a roundhead.* Don't be a plum. Oliver, I think I have given you something of a Roland. A man who could cut off the head of a monarch shouldn't grumble if an artist profits by the example, and lops off the head of another useless growth."

Photographers, we are told, George, have not read "The Outline of History," yet I think we all know something about Cromwell. He was a background for warts.

Now, back we go to the full length and the story it ought to tell. Why are big feet like warts, George? No, it has nothing

to do with protectors; the answer is because they are not worth immortalising. Fortunately the interdependence of the toes presents no problem to the photographer, but the hands are well worth the study we can give them, for there are great and characteristic differences in hands, frequently quite ignored by the superficial worker. In his admirable book on oil painting, Mr. Solomon, in illustrating how to draw a hand, tells that the successful student will have a drawing, not of a hand, but of *the* hand of the model. Now, as in literature, there is realistic treatment and what is known as idealism in photography. Many a clever, honest portraitist would starve to death if he only dealt in realism. Never forget, George, that I am concerned about your ability to produce photographs that will earn you money, not about the making of prints for exhibitions. Well, then, think of the hands again. The great thing to know is not how to show character by the hands, but simply how to photograph hands so that they look graceful instead of awkward, and to have a good stock of tricks of camouflage and occupation to show them to the best advantage.

It is just the plate illustration over again, except that the hand may be bent, or the fingers folded, yielding infinitely more variety. I would say to you, George, always think of the edge of the hand, and avoid as far as possible the back view. There is one mistake frequently made by good portrait photographers, and seldom by painters or art students, that is the view of a lady's hand in repose; a well bred woman will always sit with her hands on her lap, palms upwards. There are a score of great pictures in my mind's eye affording excellent examples of this, Gainsborough's Duchess of Devonshire being probably the best known. A walk round a picture gallery, or, better still, a few of those excellent little books illustrating the work of great painters, will educate you *if you know what you are looking for*. Few, who are not students, know anything about the full length and group work of Greuze, his heads being more widely known. Yet for a shilling you can get a book of reproductions of his works. I'll lend you my copy, George, and I would ask you to particularly notice the hands. Short of the idealistic treatment, you ought to get the hands as well as the masters. It is simply a question of knowing the tricks. Greuze knew the whole bag full.

I am giving you a print, George, of different poses of the hands, and wish you to add it to your scrap book. Needless to say, I do not want you to go copying those regardless of your subject, but I certainly think that until you have a score of different or alternative placings in your mind, when your sitter enters the studio, you are not fully equipped to make full length portraits. First go over all your old work, and blot out all the clenched fist studies. Don't shirk the difficulties by placing hands in pockets, or behind the back, if those are not otherwise easy poses. Give the hands occupation, only make it suitable. Flowers are excellent for covering awkwardness, but avoid roses which have been kicking about the studio for months. Our old friend the book should be a magazine, indeed from the studio price list to the pre-war telephone directory there should be variety at hand. A child might reasonably be occupied with Tiger Tim's annual, where a book would be ridiculous. A particularly ungraceful hand can be placed quite naturally under the cover of a good sized monthly, the other one farthest from the lens half hidden while occupied naturally enough turning over a page. A little thought and constant experiment with different material will give you a wide range in the posing of hands. Above everything else, watch the hands of the ordinary mortals with whom you come in contact daily. Allowing for the difficulties of rendering them as a painter can- difficulties inherent in photography, and which actually favour us in truthfulness—there is much more to be done in observation, in study, and in practice than is usually attempted. Study the hands well, George, in action, in repose, think of them as useful, as decorative, as dainty, as strong and gnarled, or delicate and fragile. Turn them, light them, trick out the fingers, make them button gloves, play with flowers, swing sticks, twirl the fingers of each other, clasp them, rest the head on them, do anything you jolly well like with them so long as you always think of the most beauty, and do not make too great a departure from naturalness. Face the problems on their merits, and have plenty of courage. After all, the hands of an old man may express more in awkwardness, than in studied "grace," and the bejewelled hand of a rich lady may be of far greater value to the portrait photographer than pleasing contours. The most I can ask of you, George, is that you always know what you are doing, when you are subordinating art to expediency. Experiment away then with your full lengths and be merciless in criticism of your own work. Only when you are capable of taking dozens of portraits featuring hands without faults and repetitions, only then will I allow you to say, "Confound those bally hands, I'm going to take a bust head of this clumsy sitter."

J. Effel.

THE MODERN CHEMISTRY OF GELATINE.

(In a recent communication from the Eastman Research Laboratory Dr. S. E. Sheppard reviews some of the most recent work which has been done in the complex problems which concern the part played by the gelatine in the making and use of gelatine dry-plate emulsions. These include the effect of impurities in the gelatine which reduce sensitiveness; viscosity and setting point of gelatine solutions; mechanical strength of jellies and their capacity for swelling; and the behaviour of gelatine in hardening fixing baths and on drying. The paper is being published in the United States in the "Journal of Industrial Engineering Chemistry.")

Modern photography is almost as much dependent upon gelatine as upon silver salts. The work upon gelatine which is being carried on under the author's direction at the Research Laboratory of the Eastman Kodak Company is naturally chiefly devoted to its use in photography, and the following is an outline of the function and behaviour of gelatine in photographic processes.

The two chief classes of photographic material in which gelatine plays a rôle are :—

(a) Gelatine silver halide emulsion.

(b) Bichromated gelatine layers.

In the former the part of the gelatine is fundamentally that of a binder or suspending medium for silver halides, for silver derived from these, or for compounds derived from the silver by reactions subsequent to development of the latent image. In all these cases, the special physical and colloid chemistry of gelatine is of great importance for correct understanding of the behaviour of the plate or film.

In the second class cited, the gelatine becomes, through the photo-chemical decomposition of the bichromate, itself art and part of the image.[1] In fact, the whole practice of photographic and photo-mechanical processes with bichromated gelatine, gelatose, etc., depend upon radical modifications of the properties of these colloids produced by tanning reactions, either directly or indirectly photo-chemical. This class is of more importance for photo-mechanical than for strictly photographic procedure, and will not be discussed directly in this paper.

Introduction of Gelatine into Photographic Emulsion Making.

Although he had forerunners, the credit of preparing the first

1 It may also act as a binder for a pigment, but the pigment is inert.

gelatino-silver bromide emulsion is generally ascribed to Dr. Maddox, of Liverpool, England (1871), Fig 1. His emulsion was prepared by suspending silver bromide with excess of silver nitrate in gelatine acidified with nitric acid, and development was effected with acidified pyrogallol, to which more silver nitrate was added.

Fig. 1.—R. L. Maddox.

Maddox's emulsion, therefore, belonged to the first of the two main classes of sensitive silver halide preparations:

A. Silver halide formed in presence of excess silver salt. Includes wet collodion, collodion emulsion, and most printing-out emulsions.

B. Silver halide formed in presence of excess of soluble halide. Includes both positive and negative emulsions for chemical development.

It was the previous discovery of alkaline development (of collodio-bromide emulsions) by Russell which made Maddox's experiment lead the way to the second class of emulsions, which hold first place in importance in modern photography.

Gelatines for Emulsions.

The value of gelatine for emulsions depends both upon its physical properties and its chemical composition. It is not necessary to amplify the statement that gelatine is pre-eminently an emulsoid or solvated colloid. The high degree of reversibility of the transition

$$\text{Hydrosol} \rightleftharpoons \text{Hydrogel}$$

at conveniently attainable temperatures is a fact of first importance for its use. The formation of the jelly from the hydrosol is termed *setting*, the converse passage from the jelly to the fluid solution *melting*, and it has been customary to speak of *setting points* and *melting points*. By the former was understood the temperature at which the solution congealed; by the latter, the temperature at which the jelly liquefied. These temperatures are not coincident, as in the case of a crystal, and, corresponding with this thermodynamic indetermination, are only empirically definable by experimental conventions. The writer and S. S. Sweet[2] have shown that the "setting point concentration" curve, or the "melting-point-concentration" curves, determined under standard conditions, are more characteristic of a gelatine than single setting or melting points at one concentration, although if these are taken in the region where the "point" varies linearly with the concentration—10 to 20 per cent.—a satisfactory practical comparison is usually possible. Technical gelatines are roughly classified as "hard," "medium," and "soft," in terms of the melting point. Using the writer's apparatus, the following typical results were obtained for 10-per-cent. jellies:—

No.	*Kind of Gelatine.*	*Setting Point.*	*Melting Point.*	*Trade Description.*
1.	Glue (domestic).	18.2° C.	19.8° C.	Glue.
2.	Gelatine (domestic).	23.2° C.	25.8° C.	Soft.
3.	Gelatine (foreign).	22.2° C.	24.8° C.	Soft.
4.	Gelatine (foreign).	24.8° C.	28.0° C.	Hard.
5.	Gelatine	25.1° C.	28.5° C.	Hard.

2. "J. Ind. Eng. Chem.," *13*, 323 (1921).

In common with other physical properties, the "setting" and "melting" points are largely controlled by the hydrogen ion concentration. With most photographic gelatines this corresponds (in 1 per cent. solution) to a p_H between 5 and 6, under which condition no great variation results. But, as noted later, this important constant should always be determined, in order that due adjustment be made. Apart from this, or the presence of other "ionogens" in considerable amount, the value is chiefly determined by the proportion of hydrolysed to unhydrolysed gelatine. The value is lower, the more advanced the hydrolysis, which converts the protein over into a mixture of proteoses, peptones, and amino-acids.

Recent work of C. R. Smith,[3] R. H. Bogue, and E. T. Oakes[4] has indicated the highly interesting possibility of a thermodynamically definite "transition point" between "sol" and "gel" forms of gelatine. Smith concluded, from polarimetric measurements of the muta-solution of gelatine solutions, that the point lay between 33 deg. and 35 deg. C., and suggested that it corresponded to a bimolecular condensation of gelatine "molecules." Bogue, from measurements of the plastic yield of gelatine hydrosols, finds transition at about 35 deg. C., whereas Davis and Oakes, from very valuable studies of the change of viscosity of gelatine solutions with time, have fixed it very precisely at 38.03 deg. C. Some doubt may be felt at present as to the complete validity of these conclusions, that is, as to whether the "transition point" is independent of the concentration and origin of the gelatine.[5] But the suggestion that what was formerly termed the thermal "lag" of gelatine solution is a case of "suspended transformation" is of great theoretical importance, while the attainment of temperatures of invariance of such a property as viscosity is of equal practical weight.

In the preparation of emulsions, including the coating, it is the properties of the hydrosol which are most interesting. They may be divided as follows:—

(1) Protective action.
(2) Viscosity.
(3) Influence on sensitiveness to light.

(1) *The protective action of gelatine*, e.g., in the case of gold and silver hydrosols, is well known. Values for the "gold number," by Zsigmondy and others, give, e.g.:—

Colloid.	Gold Number.
Gelatine	.005 — .01
Casein	.01
Egg albumin	.06 — 0.3
Dextrin	10 — 20.

In a recent paper[6] it has been shown that the "gold number" of gelatines depends upon the dilution of the hydrosol, increasing therewith, and upon the age of the solution. It was not found possible satisfactorily to differentiate technical gelatines on the basis of their "gold numbers."

In the case of silver halide emulsions, this protective action, which involves inhibition of agglomeration (and crystal growth) of amicrons, is doubly important. First we may note that if silver nitrate and potassium bromide solutions, with slight excess of bromide

$$AgNO_3 + KBr = AgBr + KNO_3$$

are mixed in darkness, and the precipitated silver bromide washed with water, then it is found to be immediately reducible by any of the usual developers. If quite small amounts of gelatine are added, the reduction is greatly slowed down, and this inhibition increases rapidly with the amount of gelatine, till a maximum effect is soon reached. Sheppard and Mees attributed this protective power largely to the insulation of the silver halide particles from dust, etc., nuclei, with which effect is associated a delay in aggregation of silver amicrons to form larger nuclei. It is possible to prepare colloid-free silver bromide layers, which can give a developable image, but "chemical fog" occurs much earlier.

The same protective effect is, however, at work in securing fine-grained precipitates of the silver halide. Emulsions in which the silver halide particles are largely of submicroscopic dimensions are the so-called Lippmann emulsions of silver bromide, for interference photochromy, and silver chloride positive emulsions, i.e.,

3. "J. Am. Chem. Soc.," *41*, 135 (1919).
4. C. E. Davis and E. T. Oakes, "J. Am. Chem. Soc.," *44*, 454 (1922).
5. cf. the valuable studies of Arisz on "The Sol and Gel State of Gelatine Solutions." Koll. Beihefte 7, 1 (1915).
6. F. A. Elliott and S. E. Sheppard, "J. Ind. Eng. Chem.," *13*, 699 (1921).

for lantern slides and transparencies. For negative emulsions, of higher "speed," the grain is considerably coarser, being in fact definitely crystalline[7], and one great advantage of gelatine over collodion is that it permits the growth and opening of the crystals.

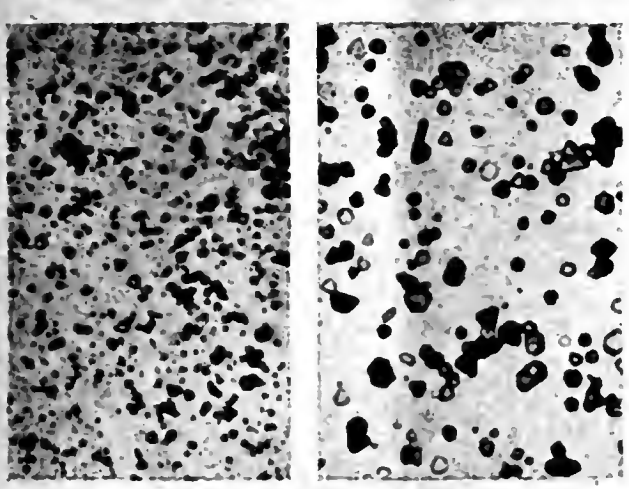


Fig. 2.—Silver bromide grains of emulsions. Magnification, about 2,500.

Crystals in Gelatino-Silver Bromide Emulsion.

Heating suspensions tends to agglomerate the particles and lessen the dispersity, and since negative emulsions are "ripened" by heat to increase their sensitiveness and density-giving power, it has, therefore, been supposed that high-speed negative emulsions, with coarse grains, simply represent a stage produced from fine-grained emulsions by heat treatment and Ostwald ripening. This is not the case. The conditions in the preparation of the coarser-grained "high-speed" emulsions are different, and, in particular, the concentration of the reactants is higher, and that of the gelatine is lower. The importance of these factors is very definitely outlined, if not yet completely covered, by Von Weimarn's theory, and is illustrated in the following diagrams :—

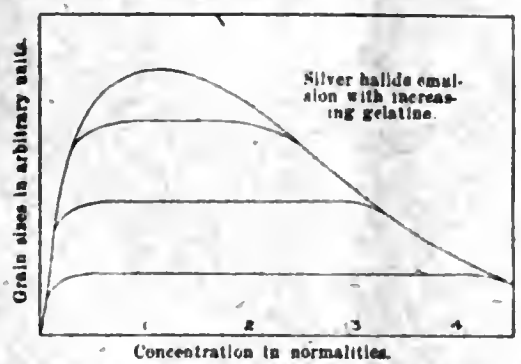


Fig. 3.—Influence of gelatine on average grain-size of silver bromide.

The influence of increasing concentration of gelatine in extending the region of minimum dispersity, but lowering the dispersity itself is illustrated here. Recent work of Odén[8] indicates that the degree of dispersion of the primary grains of precipitates (gelatine absent) steadily diminishes as the concentration decreases. The maximum observed by Von Weimarn and others is due to secondary aggregation; this may, however, be of equal importance technically.

(2) Viscosity.

A. *At one concentration*, and at one temperature preferably not below 40° C. and not above 50° C.

Factor.	*Influence.*	*Authority.*
i. H-ion activity	Viscosity is a minimum at p_H 4.7–4.8, the iso-electric point. Rises to a maximum p_H 2 to 3.3, and again between p_H 8 to 10.	J. Loeb, R. H. Bogue, E. T. Oakes. Oakes' conclusions differ somewhat from Loeb's.
ii. Cations, e.g., from ash constituents. Na .. mono Ca .. di- Al .. tri- Fe .. tri-	Viscosity effect depends upon concomitant p_H variation; when $p_H > 4.8$ gelatine combines only with cations. At same p_H monovalent cations give same viscosity, polyvalent cations lower than monovalent.[9]	J. Loeb.
iii. Anions, e.g., Cl^I .. mono	When $p_H < 4.8$, gelatine combines with anions only. At same p_H, the monobasic acids HCl, HBr, HNO_3 and acetic give identical effect, oxalic, tartaric, succinic, citric and phosphoric nearly the same as the monobasic acids. H_2SO_4 gives a lower value.[10]	J. Loeb.
iv. Non-electrolytes. ..	Methyl and ethyl-alcohol lower viscosity, glycerol and sugars increase. (Compare effect on water.)	
v. Composition & hydrolysis.	Gelatine, even when free from congeners such as mucin, is a mixture of unhydrolysed and hydrolysed protein. The greater the proportion of hydrolysates (proteoses, peptones, amino-acids) the lower the viscosity.	Levites, von Schroeder, R. H. Bogue.
vi. Age of solution	—	—
vii. Rate of Shear	Inhomogeneous systems, as suspensions, emulsions, colloids, have a lower limit on yield point of shearing stress, below which the displacement is not proportional to the stress. Gelatine sols show "plastic yield," according to concentration and temperature.	E. C. Bingham

B. *Concentration variable.*

Concentration.	*Ceteris paribus*, the viscosity of a gelatine sol increases very rapidly with concentration. The concentrations region of interest, photographically, is from 5 to 10 per cent.	R. H. Bogue finds that Hatchek's formula is inapplicable *per se*, but may be semi-empirically corrected. Davis and Oakes find Arrhennius' formula more satisfactory.

C. *Temperature and transition.*

i. Temperature.	Viscosity decreases with rise of temperature. Furthermore, the rate of hydrolysis increases (depending again upon p_H). From recent experiments we found it to be quite perceptible at high and low values of p_H, even at 50° C.	S. E. Sheppard and F. A. Elliott.
ii. Transition ..	From work on the muta-rotation of gelatine sols C. R. Smith concluded that a transition-point between *sol* and *gel* forms of gelatine existed at 34–35° C. Bogue measured the viscosity of gelatine sols at different rates of shear, and deduced from the occurrence of plastic yield a value (about 35°)	C. R. Smith, R. H. Bogue, E. T. Oakes.
	Experiments in this laboratory show plastic yield to occur at different temperatures according to the concentration.	S. E. Sheppard and F. A. Elliott.
	Davis and Oakes have attacked the problem from the standpoint of time-variations of viscosity and found for their material, 38.03° C., a temperature of invariance. Above or below this temperature the gelatine-water system may be in a state of suspended transformation.	S. E. Sheppard.

(To be continued.)

7. See "The Silver Bromide Grain of Photographic Emulsion," by A. P. H. Trivelli and S. E. Sheppard (Van Nostrand, 1921).
8. Sv. Odén, Arkiv för Kemi (Stockholm), 7, No. 26 (1920).
9. Complications due to precipitation of membranes by trivalent cations excluded.
10. The other polybasic acids combine with gelatine as monobasic.

ELECTRIC CURRENT AT POWER RATE.

JUDGMENT IN THE COURT OF APPEAL.

In the Court of Appeal, on November 2, before Lord Justices Bankes and Scrutton and Mr. Justice Eve, judgment was given on the application by the Wykeham Studios, Ltd., of Victoria Street, Westminster, against the decision of Mr. Justice Swift, in the King's Bench Division last May, in reference to the claim brought by the Westminster Electric Supply Corporation, Ltd., for payment for electric current used in a studio arc lamp. The appellants in the present action were thus the defendants, namely, the Wykeham Studios, Ltd., in the action in the lower Court. The respondents were the previous plaintiffs, namely, the Westminster Electric Supply Corporation, Ltd.

Mr. Blanco White appeared for the appellants and Mr. W. S. Kenney represented the respondents.

Mr. Blanco White, in opening the appeal, said plaintiffs claimed £82 10s. 9d. as the price of electricity supplied to the defendants who were photographers carrying on business within the area supplied by plaintiffs. £40 5s. 10d. was admitted by defendants to be due, and was paid. The amount in dispute was the balance, £34 12s. 7d., and as to that the defence was that it represented the electricity supplied for use in a powerful arc lamp in defendants' studio, which was a special sort of lamp used by defendants for the purpose of creating a very great light to be switched on at the exact moment that a photograph was being taken. The defendants had their studio wired in the ordinary way for incandescent light, but exactly at the moment a plate was exposed this strong light, about 10,000 candle-power, was switched on. The question was whether the electricity used for that lamp should be charged for at the power rate or at the lighting rate. The power rate was 2d. per unit and the lighting rate 8d. per unit. If defendants were only liable for the power rate, then they were not liable for the balance, and £48 5s. 10d. was enough. If defendants were liable to pay at the lighting rate, then plaintiffs were right. There was no dispute as to the figures. The judge had found that plaintiffs were entitled to charge at the lighting rate. He said that was wrong. There was a separate meter for this light. There was no statutory distinction between current supplied for power and lighting purposes. It was a distinction introduced by the supply authorities themselves for their own commercial purposes. They quoted a lower rate for power purposes to induce people to take electricity during the daytime. Plaintiffs were entitled to charge 8d. unless defendants could protect themselves by Sections 19 and 20 of the Electric Power Construction Act of 1882. His case was that this particular supply was being used by defendants for power purposes, that the plaintiffs' system was to supply their consumers generally for power purposes at 2d. a unit, and that defendants were, by Section 19, entitled to be supplied at 2d. a unit. The judge had found on the facts that defendants' supply was a power supply, but that, nevertheless, plaintiffs were entitled to charge at more than their advertised power rate. Power supply was defined by the suppliers as electricity used directly or indirectly for purposes other than lighting.

Mr. Justice Eve: That is exactly what you do use it for. You light your lamp for the moment of time when you are taking somebody's more or less engaging face.

Mr. Blanco White said the judge had found that defendants were using it for power. A distinction had to be drawn between light and electricity used for the purposes of lighting. Electricity could make light in many ways, even when it was not used for the purpose of lighting. It might be used for medical or for heating purposes. Here his case was that it was not used for the purpose of lighting. This arc lamp was on a separate circuit from the ordinary lighting lamps. It was of no use for lighting purposes owing to its intense glare. It was used for the purpose of effecting a chemical change in the photo-plates. It was not used for lighting, though, incidentally, it gave out light.

He referred to the agreements between the parties, and Lord Justice Bankes remarked that in the agreemente this arc lamp seemed to have been treated as a special form of power. The judge had found that was so and that the plaintiffs were entitled to do so provided they treated all photographers alike.

Mr. Blanco White submitted that was wrong in law.

Lord Justice Bankes said the plaintiffs had got a free hand to charge what they liked within the maximum, and it was for the defendants to show that plaintiffs were not entitled to treat this as a special class of power user.

Mr. Blanco White explained that a special arrangement was made in October, 1921, by which since that date defendants and other professional photographers in the area were charged 4d. a unit for these arc lamps. Plaintiffs' contention was that the consumption did not warrant a supply being given at other than the lighting rate. Plaintiffs had not given any evidence differentiating photographers from other persons who used power intermittently during the daytime.

Without calling on the other side the Court gave judgment.

Lord Justice Bankes said this was an appeal from a decision of Mr. Justice Swift, which appeared to him to be quite right. The claim was by the plaintiffs for charges for electricity supplied to the defendants for a certain period, and over that portion of their supply which was used in the defendants' photographic arc lamp this dispute arose, defendants contending that they had been overcharged in respect of that portion of the supply. It was not disputed that as a matter of practice plaintiffs and other supply companies did make a difference in the prices they charged between a supply for lighting purposes and current supplied for power purposes, but they were entitled under their statutory powers to charge for both classes up to whatever their maximum charge might be. The statute of 1882 contained provisions against granting one customer a preference over another customer, and the case for the defendants here rested on the contention that the plaintiff company had not brought themselves within the protection, if he might so express it, of Section 19 of the Act, which provided that where a supply of electricity was provided in any part of an area for private purposes every company or person within that part of the area should, on application, be entitled to a supply on the same terms on which any other company or person in such part of the area was entitled under similar circumstances to a corresponding supply. Now the case for the defendants was this: that this current was in fact supplied for power purposes. That was so found by the judge, and in his opinion was rightly found, having regard to the definition of power purposes. They said, however, that plaintiffs were overcharging them because they were charging 4d. a unit, whereas plaintiffs charged their other customers who were not photographers for power within their district 2d. a unit, and plaintiffs could not justify that. The answer of the Electric Company was this: It is true we do charge you and all other photographers who take current for these arc lamps a charge in excess of what we are charging other customers for power, but we say we are justified because in the language of the section the circumstances are not similar, and the supply is not a corresponding supply. This question as to the right of a supply company to make differential charges had been before the Court on several occasions. Mr. Justice Sargent's judgment in the Attorney-General *v.* Long Eaton Parish Council had been cited and relied on. Mr. Justice Sargent said: "Under each section of the Act of 1882 I think that the whole circumstances may be considered from the broadest possible point of view, and the question is whether the circumstances affecting customer A and customer B in relation to their supplies of power are substantially dissimilar or sufficiently dissimilar to justify broadly the differentiation proposed by the supply company." Applying that test to this case, customers A were photographers and customers B were all other customers in the district who received power at the power rate, and the question was whether it was sufficiently established here, taking what the judge described as the broadest point of view of the position, that the circumstances in which the photographers were taking current for these arc lights were substantially dissimilar to justify the differentiation. It was true no evidence was given in reference to the particular length of use of the current for the arc lamps, but apparently the judge was allowed to use his own knowledge of these matters and his own common sense. These lights were of many thousand candle-power, and the Court were entitled, from their knowledge, to conclude that these arc lights were used at intervals only, depending on the number of customers and the number of photographs taken. Secondly, when they were, in fact, used it was only for a short period of time. In these circumstances, was the judge entitled to come to the conclusion that the circumstances as between these two kinds of customers were circumstances substantially dissimilar? He thought the judge was right, and he thought the defendants had failed to establish that the charge which plaintiffs sought to make was an overcharge. The appeal must therefore be dismissed, with costs.

The other judges concurred.

BURGLARY AT A STUDIO.—A burglar had a busy time in Knightsbridge last Friday. Four shops were broken into, including the premises of H. Walter Barnett & Co., photographers, where two cameras were stolen. The burglar was captured.

Photo-Mechanical Notes.

Election Posters.

THE approaching election affords the lithographer an opportunity to specialise in the rapid and cheap reproduction of enlarged poster photographs of the various candidates.

The method used must be one that lends itself to quick reproduction, and for this purpose the Bromoil transfer method, or the making of an enlarged negative on bromide paper, and from this printing on the sensitised zinc, is particularly suitable.

Working by enlarged paper negative is as follows:—A small screen negative is made from the original photograph. The screen selected will depend upon the enlargement required.

Screen.	Enlargement.	Reproduction.
60	2	30 lines to each.
60	4	15 lines to each.
120	8	15 lines to each.
120	12	10 lines to each.
150	3	30 lines to each.
150	5	30 lines to each.

The dot effect disappears for the normal individual.

10 lines to inch, 25 feet away
15 lines to inch, 15 feet away.
30 lines to inch, 8 feet away
50 lines to inch, 5 feet away.

The high-light dots should not be as closed up as is usual for ordinary direct photo-litho, and the shadow dots should be somewhat larger. The screen negative is enlarged upon a contrasty bromide paper, having a thin paper support, or upon "Transfero type" contrasty paper; if the latter paper is used the gelatine film containing the silver emulsion can be transferred to glass, and then reduced or intensified if necessary. Paper negatives should be correctly exposed and then well developed in a non-stain developer, as directed below. When dry, the paper negative can be made translucent by applying the following mixture to the paper side of the print:—

Castor oil, 4 ozs.
Ether, 1 oz.

The negative, when ready, is placed face down on the sensitised zinc and exposure made to a strong light in a vacuum printing frame. Exposure is about 6 times as long as for an ordinary glass negative. Any type-matter required can be set up and an impression taken on transfer paper and transferred to the zinc-plate, or this can be drawn or written on white Bristol board, and the portrait stuck in the required position, when it can be obtained on the negative. If the type-matter is drawn in a good black ink in which is mixed a little gamboge it will be an easy matter to prevent the dot effect forming, so that it will print solid.

The production of the Bromoil transfers is as follows:—

The screen negative is enlarged on a glossy contrasty bromide paper and then well developed in one of the following developers, Glycin for preference:—

Glycin.

Water	10 ozs.
Soda sulphite	250 grs.
Potass carbonate	500 grs.
Glycin	100 grs.
Potass bromide	3 grs.

Metol-Hydroquinone.

Water	10 ozs.
Metol	20 grs.
Soda sulphite	360 grs.
Potass carbonate	120 grs.
Hydroquinone	30 grs.
Potass bromide	20 grs.

Only correctly exposed and well-developed prints will ink up properly. After development the paper is thoroughly washed, but not fixed at this stage. The developer must be washed out before applying the bleaching solution, which is made as follows:—

A.—Chromic acid (pure), 10 per cent. solution.
B.—Copper sulphate, 200 grs.
Common salt, 2 ozs.
Water, 10 ozs.

For use take of A—½ oz.
B—10 ozs.
Water—20 ozs.

The temperature of this solution should be 65—70 Fahr. At this temperature bleaching will take about 10 minutes. After bleaching the print is well washed and then placed in the following bath for 5 minutes:—

Hypo	6 ozs.
Metabisulphite of potash	½ oz.
Water	40 ozs.

The temperature of the bath should not be below 60 deg. Fahr. Again wash the print and dab moisture off with blotting paper and then with a chamois leather. The print can then be placed in methylated spirits for about 2 minutes, and then hung up for 5 minutes, when it should be ready to receive the transfer ink which is stone to stone retransfer ink, let down with a small quantity of mid litho varnish and a few drops of oil of spike, lavender and rectified turps. If the transfer is allowed to dry the ink can be applied by a roller until a thin grey coating of ink is obtained. The print is developed by soaking in slightly warm water for 10 minutes, and then removing it from the unexposed portion by gently rubbing with a swab of cotton wool. The transfer, when complete, is transferred to zinc by the usual method. Bromoil transfers can be rolled up 5 or 6 times provided the gelatine will still hold to the paper support. After the first transfer has been taken the surface should be carefully cleaned with solvent naphtha, and when the naphtha has evaporated some of the following solution can be applied to the surface and then dabbed off with fluffless blotting paper:—

10 per cent. ammonia	1 oz.
Glycerine	3 ozs.
Water	10 ozs.

Inking up can then be carried out, X-Tone.

The following patents have been applied for:—

BAS RELIEFS. No. 27,936. Photo-mechanical process for producing bas-reliefs. Mauseath Photo Sculpture, Ltd.

PRINTING BLOCKS. No. 27,293. Process of producing photo-mechanical printing blocks. A. Galetzka and O. Richter.

TRANSFER METHOD. No. 29,126. Transferring images on to zinc, etc., plates for printing. C. H. Stringer.

Exhibitions.

BRITISH LANDSCAPE PRINTS.

AN exhibition of landscape work that shows us, as a nation, where we are is just what was wanted. The Affiliated Societies of Great Britain have evidently felt that as landscape is the national art, landscape should be encouraged in amateur photography; and so for the month of November the Royal Photographic Society is covering its walls at 35, Russell Square, that all may see what can be done by the real amateur who does not want to become a professional portraitist, and who is anxious to try his skill against all the talented American and Colonial landscapists who usually grace our shows. The idea is creditable, and the results are quite reassuring.

As far as my recollection goes, this exhibition is the first of its kind and if it were possible to remember any show of recent years and consider it on its landscape merits alone, this would probably be found to excel. Yet one of our most talented landscapists does not send Mr. Betram Cox. The honours are perhaps carried off by Mr. Charles Job, whose fine work scores because there is more of it than there is of any other individual. His best picture to my mind, is "An Old Bridge, Pulborough" (8). It looks something like a "Liber" print of Turner's, so beautifully designed and in good keeping is it. It has merits at all points and of common distinction in photography. The sky, the river, the bridge, the quiet effect, the general strength and mastery all go to make this work a camera classic.

Landscape has moved on surely but slowly. It has wisely been content to step in the footprints of the painters, recognising, perhaps, that the aim is no longer primarily to make a good photograph, but to make a good picture. Some men are treading pretty closely in the old footprints; for example, H. van Wadenoyen, junr., whose "Sand, Sea and Sky" (58), with its extreme gradation of sky and low horizon, is about as close a copy of a water-colour by D. Murray Smith as could be achieved by photography.

What is most striking, however, to those who knew the photographs of the long past is the wider, more exalted, vision, which

seeks less to give the concrete facts by a righteous and meticulous technique than to give the abstract, the illusive, by any and all means. Sometimes this is offered in spite of the incidental misfortunes of composition, as in Fred Judge's exquisite effect of light on a ploughed field, which, in "The Choked Plough," finishes at a horizontal line against the sky dividing the print into halves like a domino. It is better to have the light and quality at this cost than not to have it at all.

Such works are, however, but a symptom of the new vision. The feeling for orderly and well-balanced composition is equally characteristic. "The Straw Stack," by T. H. B. Scott, is a noble design, and so is his "Summer." A very notable work combining happy design and an intense feeling for quality is H. van Wadenoyen's "Houses at Cowbridge," which with its single vertical plane and its lack of distance is scarcely a landscape at all in the narrow sense of the term, and yet the qualities it possesses should be, and are, the objectives of all who produce landscape in the true spirit.

The romance of the weather, as well as the literary romance, is likewise a characteristic of modern British camera work. Foreign countries, for the most part, may enjoy more sunshine, but they certainly experience less variety than we do in these islands, and that change of mood in Nature is the photographer's salvation. It gives him a thousand dramatic skies for one in other lands; it shows him the soft cloud shadows chasing each other over hill and plain; it secures for him the diffusion of light instead of a merciless directness of the sun's rays; it brings mist and vapour to soften hard edges and notes, and to wrap everything together in harmony. It has always done these things, but the photographer has been ignorant of the fact until recent years, and this show, with its exemplars of all these conditions, is a veritable manifesto of British photographers. Nothing else has so distinctly marked a stage in the gradual development of the new vision from the old.—F. C. Tilney.

FORTHCOMING EXHIBITIONS.

November 4 to 11.—Bournemouth Camera Club. Particulars from the Hon. Secretary, 88, Old Christchurch Road, Bournemouth.

December 9 to 31.—Rochdale Amateur Photographic Society. Particulars from the Hon. Secretary, W. Lord, 10, Derwent Street, Rochdale.

1923.

February 5 to March 3.—Northern Photographic Exhibition, City Art Gallery, Manchester. Latest date for entries, January 12. Particulars from the Hon. Exhibition Secretary, Walter Johnson, 30, Hartington Road, Chorlton-cum-Hardy, Manchester.

March 1 to 8.—Birmingham Photographic Society. Latest date for entries, February 15. Particulars from the Hon. Secretary, J. E. Breeze, 178, Broad Street, Birmingham.

March 2 to 31.—Pittsburgh Salon of Photography. Latest date, February 5. Secretary, Charles K. Archer, 1,412, Carnegie Building, Pittsburgh, Pa., U.S.A.

March 13 to 16.—Exeter and West of England Photographic Exhibition. Particulars from the Hon. Secretary, Frederic G. Tutton, 9, Union Road, Pennsylvania, Exeter.

March 15 to 24.—Photographic Fair, Holland Park Hall. Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1.

Leyland Motor Photographs.—Prizes have been awarded by Messrs. Leyland Motors, Ltd., in the last quarterly competition for photographs of Leyland vehicles. As manufacturers of motor lorries, a de luxe tourist chassis, and, recently, the remarkable little "Trojan" car selling at £175, the Leyland Company have long appreciated the value of photographs as part of their sales organisation. The prize-winners are as follows:—1st, H. Lunn, Slaithwaite (£3 3s.); 2nd, Eric Guy, Basingstoke (£2 2s.); 3rd, W. Andrews, Norwich (10s. 6d.); 4th, W. S. Trapp, Southport (10s. 6d.); 5th, W. H. Counsell, Rishton (10s. 6d.). Consolation prizes of 5s. were also awarded to:—W. H. Topham, Grimsby; F. Marshall, Birmingham; S. Goldsack, Chatham; H. H. Cooper, Bridgeport; W. H. Mitchell, St. Helens; G. E. Swann, Keighley; J. W. May, Sheffield; W. Bretherton, Leyland; H. Godwin, Southboro'. The competition is being continued during the present quarter, the closing date being December 30. Particulars from the Company at Leyland, Lancs.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, October 23 to 28.

Cameras.—Nos. 29,418 and 29,419. Folding cameras. Baille-Lemaire et Fils.

Enlarging.—No. 29,037. Photographic enlarging apparatus. A. C. W. Aldis.

Focussing Devices.—No. 29,420. Focussing devices for cameras. Baille-Lemaire et Fils.

Photographic Mediums.—No. 28,821. Photographic mediums. Wadsworth Watch Case Co.

Printing Frames.—No. 28,850. Photographic printing frames. F. Taylor.

Sensitised Papers.—No. 29,053. Sensitised papers. Hydroloid, Ltd. (Exportingenieure für Papier und Zellstofftechnik Ges.).

Cinematography.—No. 28,825. Cinematograph, etc., screen. C. A. Clark.

Cinematography.—No. 29,348. Production of cinematograph films and cameras therefor. C. A. Lowe.

Colour Cinematography.—No. 28,902. Two-colour cinematography. Cinechrome Instruments, Ltd., and S. J. Cox.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

Lantern Screens.—Non. 166,133. (July 9, 1920.) The screen consists of a sheet of plate-glass having a "satiny sheeny" surface A continuous succession of approximately equal rounded off projections are made on the surface. Such formations, being of minute and regular character, are almost invisible to the naked eye. The back of the screen may also be silvered. The glass plate may be covered with a series of flutes, prisms, ridges, grooves, or corrugations. The satiny sheeny surface is produced by first heavily etching with "white acid" or sand-blasting, and subsequently reducing or cleaning with hydrofluoric acid. The screens are of great efficiency, and permit of the entirely satisfactory viewing, in full indoor daylight, or in the presence of bright artificial light, of cinematographic or other pictures. It will also permit of the projection in darkness of pictures of entirely satisfactory brilliance, but with much less expenditure of light power than is necessary under the usual screen conditions. The amount of heat generated in the operating box and the cost of projection is thus reduced. A surface optically equivalent to the "satin-surface" obtained by acid etching may be made by sandblasting or grinding and subsequently "reducing" or "clearing" very fully with hydrofluoric acid, so that the original great diffusivity of the frosted surface is very markedly reduced.

In the case of a surface provided with flutes, prisms, ridges, grooves, or corrugations, these are arranged vertically from top to bottom, either on the back (with a view to the prevention of the lodgment of dust), or on the front of the "screen," or in some cases on each surface. Such corrugations ensure a considerable expansion of the lateral limits within which the image formed on such "screen" may be viewed efficiently.

The first illustrative embodiment of the invention takes the form of a "screen" adapted for the display of lantern, cinema or other pictures. It consists of a sheet of plate-glass the back surface of which is prepared in accordance with the "satin-surface" or its optical equivalent, and is silvered and backed as is usual in the manufacture of glass mirrors. As a modification of this, the front surface (which is unsilvered) also is prepared with "satin-surface" the reflection mirror-wise of the projecting lantern by such surface being thereby prevented.—Percy Edward Correll, Verco Building, North Terrace, Adelaide, South Australia.

The following complete specifications are open to public inspection before acceptance :—

DEVELOPING TANK.—No. 187,228. Photographic developing tank. A. Waterworth.

SHUTTER.—No. 187,242. Photographic shutter with movable screen. Compagnie Aerienne Francaise.

New Materials.

Materials for Embossed Photographs. Made by Bardilis, 75, Gt, Titchfield Street, London, W.1.

THE production of photographs, especially portraits, in embossed relief interested photographers now and again years ago, but the absence of a simple yet effective process has prevented many from attempting the work. The "Releefoto" process therefore invites favourable comment, since it provides a method which may be easily operated without previous experience and with a complete absence of apparatus. The previous methods of obtaining embossed photographs have required some type of press, but in this system the relief is obtained simply by spreading on the print a preparation which, when dry, expands the paper. The resulting embossed prints are very attractive in appearance; a few specimens shown in a photographer's window can hardly fail in attracting attention by their novelty and distinctive quality.

A photograph, preferably on a collodion self-toning paper, is taken, and upon the back a rough outline of the part which is to be embossed is made with a blacklead pencil. The print is then coated within this outline with a substance supplied by the makers, which has the name of "Releefoto." It is a thick, jelly-like preparation, strongly smelling of amyl acetate, and it is applied in a novel manner. In the set of materials are included a number of small cones, strongly made of glucose paper. One of these is partly filled with the preparation, and the end folded over. The apex of the cone is then cut off, and the "Releefoto" may be pressed out through the small orifice thus made. This is applied carefully to the portion marked on the print, and, when completed, the print is hung up to dry. When quite dry, and this takes some hours, the portion coated with the preparation will be found to have considerable relief, and the print may then be mounted in the usual manner. We have tested the process and find it extremely simple to work. Quite good results, showing considerable relief, are obtained with astonishing ease. The necessary materials are supplied in two sets. Set No. 1, containing a tube of "Releefoto," mounting boards, and glucose paper cones, together with a print suitable for embossing, retails at 5s. 6d. Outfit No. 2 contains, in addition to larger quantities of the above materials, a packet of printing paper, tube of mountant, and four bottles of tinting solutions with the necessary brush. This outfit retails at 10s. 6d. Full directions for working the process are included in each set.

TRANSPARENT TISSUES.—The Vanguard Manufacturing Co., Maidenhead, send us specimens of the new thin transparent tissues which they are supplying for the insertion of titles into negatives, autograph greetings, and similar additions to prints without the added labour of a further printing. Any inscription is written with a fine pen on the tissue, using the ordinary "Photopake" of the Vanguard Company. The tissues take this preparation exceedingly well, so that the finest writing or tracing which is ordinarily required can be very readily done. The tissue is of extreme thinness, as thin as tissue paper, yet perfectly transparent and flexible and free from any visible structure. Apparently it is not a manufacture from celluloid, since, on applying a match, it burns with very much less flame than a piece of newspaper. We are quite sure that the tissues will find many uses in every studio establishment. They are supplied in half-plate or 7 x 5 size, price 1s. per packet of 18 sheets. A shilling packet of 36 sheets of quarter-plate size is also sold.

CHRISTMAS MOUNTS.—Messrs. W. Butcher & Sons, Ltd., Camera House, Farringdon Avenue, London, E.C.4, are supplying a selection of artistic calendar and passe-partout mounts for the Christmas trade. Series 6281 and 6291 are attractive calendars, and are made in four sizes suitable for C.D.V., ½-plate, Ia F.P.K., and postcard prints, either upright or oblong. No. 6281 is made of matt white card with deckle edge, and an overlay of linen faced board or black linen faced card; while No. 6291 is of black or brown card overlaid in matt white or fawn. These mounts, which are suitable for any type of print, are illustrated below.

In passe-partout mounts, the "Kwick" mount greeting card is extremely well made, and is supplied in either brown or grey. The introduction of a personal note has been provided for in the "Artist" series of passe-partout mounts, in that a small card

bearing the signature of the sender may be inserted to cover an opening before attaching the back. Five sizes, with various greetings, are available in this series, ranging from V.P.K. to postcard. Particulars of these mounts are contained in the booklet "Photography in the Home," which may be obtained from Messrs. Butcher upon application.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SUNDAY, NOVEMBER 12.

United Stereoscopic Soc. "Isle of Purbeck." G. E. W. Herbert.

MONDAY, NOVEMBER 13.

Birmingham Phot. Art Club. Extraordinary General Meeting.
Bradford Phot. Soc. Members' Print Night.
City of London and Cripplegate P.S. Outing Print Competition.
Dewsbury P.S. "A Journey to Mexico and the Far West." L. Whitehead.
Kidderminster and District P.S. "Home Photography." A. Jordan Pyke.
Kinning Park Co-op. Soc. C.C. Enlarging.
Southampton C.C. "Egypt, Past and Present." Capt. D. McWhinnie.
Wallasey Amateur P.S. "Across France to the Pyrenees." W. Butcher & Sons, Ltd.
Willesden Phot. Soc. "Mont St. Michel." H. W. Fincham.

TUESDAY, NOVEMBER 14.

Royal Photographic Society. Technical Meeting under the control of the Scientific and Technical Group.
Birmingham Phot. Soc. "Orthochromatism." W. B. Shaw.
Bournemouth Camera Club. Instructional Evening. J. Thomas.
Cambridge and District Phot. Club. "Development." L. J. Jarman.
Exeter C.C. "The Romantic in Landscape." F. C. Tilney.
Hackney P.S. Outings Competitions: Prints and Slides.
Halifax Scientific Soc. "Bromoil." H. Bairstow.
Leeds P.S. "The Flora and Fauna of the Scillies." G. A. Booth.
Manchester Amateur Phot. Soc. "Flowers and Still Life Photography."
Maidstone and District P.S. "The Sanderson Hand Camera." T. W. Dadd.
Morley Amateur Phot. Soc. "Yorkshire Dales." S. Guy.
Portsmouth Camera Club. "Oil Prints." Dr. B. Stone.
Slough and District Y.M.C.A. Phot. Club. "Modern Negative Making." Malcolm B. Fleming.
South Glasgow C.C. Lantern Slide Monthly Competition and Criticism of Slides.

WEDNESDAY, NOVEMBER 15.

Birkenhead Phot. Assoc. "The Ice and Snow Scenery of Switzerland." Dr. C. Thurstan Holland.
Borough Polytechnic P.S. 1921 Competition Prints.
Bristol Phot. Club. Lantern Lecture. C. Pollard Crowther.
Croydon C.C. "Rambles with the Paget Colour Plate." F. R. Newens.

Edinburgh Phot. Soc. "Mounts and Mounting." W. Campbell.
Forest Hill and Sydenham P.S. "Brown and Black Bromide Papers." W. T. Browne
Partick C.C. "Retouching, Intensification, and Reduction." J. A. Horsburgh.
Rochdale P.S. "How I make my Lantern Slides." Travis Burton.
South Suburban and Catford Phot. Socs. "Algeria and Tunisia." F. G. Newmarch.

THURSDAY, NOVEMBER 16.

Coatbridge Phot. Assoc. "Enlarging." E. Samson.
Gateshead and District C.C. "'Ilford' Lantern Plates." A. Brooker.
Hackney Phot. Soc. Loughton to Woodford. A. Doree.
Hammersmith Hampshire House P.S. "More Illustrated Stories of My Life in Palestine." P. R. Salmon.
Letchworth Camera Club. "Lantern Slide Making." D. W. Brunt.
North Middlesex P.S. "Photomicrography." Jas. Duncan-Reid.
Richmond Camera Club. Competitions, Prints and Slides.
South Glasgow Camera Club. Whist Drive.
Wimbledon and District C.C. "Exposure and Development of Plates." T. W. Derrington.

FRIDAY, NOVEMBER 17.

Royal Photographic Society. "Definition and Diffusion of Image." N. E. Luboshez.

SATURDAY, NOVEMBER 18.

Borough Polytechnic Phot. Soc. Dance in Edric Hall.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, November 7.

The occasion being the delivery of the President's address, Mr. Wastell vacated the chair in favour of Mr. Dudley Johnston.

Mr. Wastell took as his subject the evolution of the lantern slide, and followed a disappointingly brief discourse by a large display on the screen of transparencies, illustrating the development of the lantern-slide from pre-photographic days to the present time. However, his many humorous comments on these latter were a compensation for the brevity of his more formal address.

The origin of the lantern slide could, perhaps, be traced, said Mr. Wastell, to the period of John Baptiste de la Porta, who, when he was only 16 or 17 years of age, wrote a book describing the use of a convex lens in the camera obscura. He was thus able to draw on a transparent material designs, views, etc., which were projected by the lens, and these may have been used for further examination by transmitted light. These were termed magic pictures, and possibly the term magic lantern arose from this description. Séances were given in about the year 1570, in which various objects were shown in a darkened room, but Mr. Wastell was of opinion these effects may have been exhibited by means of a concave mirror. The first slides, or sliders as they were called by some writers, were prepared by hand drawing upon glass, and were very crude, but it was about the year 1844, when moving coloured slides and chromotropes were first shown. In 1846 it was customary to use two lanterns for showing the slides, the work being so far advanced that dissolving views were possible. At the old Regent Street Polytechnic, around about the year 1891, Lewis Wright's method of optical projection was in use. Some marvellous effects were here produced, as many as six lanterns being used at one period. The dissolving effects were cleverly managed, said Mr. Wastell, and in a lurid description he explained how the whole range of seasons of the year were given with one landscape view. Noise effects, such as rain, thunder, etc., were produced by an extra operator shaking a sheet of metal or dropping barley into a hollow vessel. The first whispers of photographic slides were heard about the middle of the nineteenth century, the albumen silver process of Niepce de St. Victor, in 1847, and the wet collodion of Scott-Archer, 1851, making possible the utilisation of these processes for transparent positives. In 1853 Mr. J. B. Dancer showed some specimens of micro-photographs, an account of which appeared in the "Manchester Guardian" of that date, and these, said the lecturer, could be no other than photographic transparencies. "Chambers' Journal," in 1859, reported the fact that pictures 20 ft. in diameter were being shown to hundreds of people, and in 1860 the photographic lantern slide appeared to be fully established. An interesting reference was made by Mr. Wastell to the stereo-transparency lantern of Thos. Sutton. In the early part of 1856 this worker showed stereoscopic slides by the aid of two lanterns, the spectators being given special spectacles with which they were able to view the scenes projected upon the screen in some manner of relief. About 1856 the stereo transparencies of Messrs. Ferrier & Soulier were much in evidence, and it was suggested that the present size of the lantern slide originated from these. The stereoscopic slides consisted of two pictures, each 3¼ in. square, and possibly workers in those days found an easy method of making transparencies for lantern projection by printing single pictures upon glass from the stereo negatives.

The hand-made slides were of all sizes, those in use at the Polytechnic were, in the early days, about 8 in. by 5 in. An amusing account of a suggestion in 1857 to throw the projected image upon a cloud of vapour or upon smoke drew from the lecturer, a further suggestion that this method would be useful to travellers or explorers, and would enable them to scare the native population by night. The albumen process seemed to be extensively used, said Mr. Wastell, about 1857, and possibly was more popular, when such substances as India pale ale, coffee, tea, raspberry vinegar, and oxymel, were used as preservatives. The first commercial manufacturers of lantern slides in this country were, said the lecturer, Messrs. Negretti & Zambra, their slides being particularly of geographical or architectural interest.

At the conclusion of his address Mr. Wastell proceeded to show upon the screen many interesting examples of early coloured slides. Commencing first with mechanical slides in wooden frames, he said that it was necessary for an expert to operate them. The slowly-turning windmill and the "man eating rats" called forth loud applause. The "tiger and the tub," a relic of one's childhood days, recalled many happy memories of Christmas parties, while the skipping slides and the "growing nose" of "Ally Sloper" produced much amusement. Some of the older hand-coloured slides, using transparent oil colours, were very beautiful, the colours much resembling old stained glass. The photographic slides shown by Mr. Wastell included the products of many expert workers of to-day, one slide in particular of an extremely delicate nature, the work of Mr. J. Dudley Johnston, being much admired. Only one of the lecturer's own slides was shown, this being by the transferotype process. In conclusion, Mr. Wastell said that the latest advances in lantern slide making and projection were shown in the cinematograph film. These were merely a large number of single slides shown in rapid succession, and the latest colour processes, including Kodachrome and Prizma, demonstrated the great advances which had been made in this branch of photography.

On the proposition of Dr. Rodman, seconded by Mr. T. H. B. Scott, the hearty thanks of the meeting were accorded to the president, who, in reply, said he would also like to thank the many friends who had helped him by lending specimens.

CROYDON CAMERA CLUB.

The seating capacity of the not too vast club room was taxed to its uttermost, as Dr. C. Atkin Swan was billed to appear. An unkind fate, doubtless assisted by the weather, ruled otherwise, and all heard with much regret that Dr. Swan was confined to bed. The Secretary was also absent with a de luxe cold, and a visit to the dentist placed restrictions on the President's usual flow of speech.

With disaster in the offing, the Club is always seen at its best, and Mr. F. Ackroyd, at a few minutes' notice stepped gallantly into the breach with a really interesting narrative of a second holiday trip into Germany. In common with other Britishers, he experienced nothing but consideration and courtesy, with the possible exception of the presentation by projection of the core of an apple by a small German boy. On another occasion justifiable indignation was engendered by the action of two well-dressed ladies, who had the bad taste to apply force to Mr. Ackroyd's person from behind, in an abortive attempt to curtail a conversation with a puzzled railway booking clerk. Sad to relate, they transpired to be of a pushful English-speaking nation.

Alluding to the occupied territory, the employment of swaggering black troops by the French certainly stuck in the throat. More cheering was an account of how it felt to be a millionaire for a few weeks, and among many other side-lights one learnt without surprise that the income of a German professor often was lower than that of a street sweeper.

The discussion was earnest in tone and candid, for the audience included some who had been in the retreat from Mons, and, in the full meaning of the word, suffered captivity in Germany. It is old and painful ground, which need not again be traversed, for the facts will be remembered, excepting always by those who prefer to stultify memory for the sake of a presumed good intention in the future. Only need it be mentioned that Mr. W. E. Dunmore, who had popped over from Paris, expressed consternation at seeing no blackboard and chalk, and Mr. Tompkins, who had shot up from New Zealand, strikingly conveyed a note of active brotherhood from across the seas, not necessarily based on humanity, but rather on pride of race.

Of a certain generous and anonymous donor—anon.

THE LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.—After an absence of several years Mr. Geo. A. Booth, F.Z.S., reappeared at Liverpool on November 2, with his lecture, "Nature Study with a Camera." Mr. Booth showed a large number of slides illustrating birds, animals, insects, etc., in their native haunts, and his illustrations were not merely very fine specimens of nature studies; they were also, in the main, admirable examples of lantern-slide work.

In his introduction Mr. Booth put in a strong plea for the use of the camera by the Natural History student on two grounds. A characteristic photograph of a living animal in its native environment is of higher and more permanent value than a poor specimen, badly preserved and mounted. Secondly, and of greater importance to all lovers of nature, the ruthless collecting of specimens had already resulted in the extinction of species at such a pace that the present rapid growth of nature study with its thousands of new collectors appearing each season, each intent on his own collection, threatened to reduce the scope of future study. Thus the camera may play a large part in the preservation of rare forms of life if students will be satisfied by the photograph album instead of the glass case.

The lecturer made the claim for his special branch of work that interest in nature photography grows steadily upon the worker as the years pass owing to the inexhaustibility of the extent, and the charm of the work, whereas every other branch of photography, whether portraiture, landscape, etc.—and he had essayed all—sooner or later loses its hold on the photographer, however keen a starter he may have been.

Dr. B. T. J. Glover, in moving a vote of thanks to the lecturer, expressed the feeling of the audience when he paid a tribute to the wonderful patience and technical skill, two very necessary qualities for the production of work of such high quality as had been shown that night, which had been so clearly demonstrated by the slides projected on to the screen.

Commercial & Legal Intelligence.

NEW COMPANIES.

READ'S PHARMACY, LTD.—This private company was registered on October 3, with a capital of £400 in £1 shares. Objects: To carry on the business of dealers in photographic materials, scientific instruments, etc. The first directors are: A. E. Read, 21, Magdalen Road, Norwich, photographer and dealer in scientific apparatus (permanent governing director); Mrs. F. C. R. Read, 21, Magdalen Road, Norwich; C. I. Burns, 213, College Road, Norwich. Qualification of governing director, 200 shares; of other directors, £10. Registered office: 21, Magdalen Road, Norwich.

APEM, LTD.—This private company was registered on October 25 with a capital of £100 in £1 shares (50 pref. and 50 ord.). Objects: To carry on the business of manufacturers, exporters and importers of and dealers in photographic cameras, plates, films, papers, mounts and frames, optical lenses, prisms, binoculars and optical glass, etc. The subscribers (each with one share) are: W. Piper, 38, Alexandra Road, Croydon, secretary; H. H. Law, "Starbrick," Birkbeck Road, Mill Hill, N.W.7, sales manager.

The subscribers are to appoint the first directors. Qualification £1. Remuneration as fixed by the company. Secretary: W. Piper. Registered office: 3, Soho Square, W.1.

MR. SOLOMON J. SOLOMON PAINTS FROM PHOTOGRAPHS.—Mr. Solomon J. Solomon, the well-known R.A., has just completed the great picture of the Coronation luncheon held over eleven years ago. Sir John Bacon, who started the painting, died some time ago, and Mr. Solomon was asked to finish it. The "Daily Graphic," giving an account of the painting, says: "He (Mr. Solomon) was not at the luncheon. So, doing the best he could, he borrowed all sorts of photographs from the "Daily Graphic," visited the Guildhall several times, and started a work which will become historic. For nearly three years, at odd times, he went on painting it. But, since many of the diplomatic personages in the picture were unknown to him, he took all sorts of opportunities of attending social functions, where they were present, to obtain their likenesses." Obviously, ten year-old portraits were the most helpful.

News and Notes.

WAR FILMS.—According to the "Daily Mail," seven hundred thousand feet of films, illustrating war subjects, and weighing about two tons, are being stored in protected vaults in the basements of the War Office.

CAMERA HOUSE JOURNAL.—The November issue of Messrs. Butcher's house organ contains particulars of goods specially produced for the winter trade. Passe-partout binding, retouching and tinting outfits, the Aldis-Butcher projection lantern, and special bargains in daylight enlargers are attractive items. A dissolved acetylene outfit should prove a useful adjunct to the travelling lecturer.

ROYAL PHOTOGRAPHIC SOCIETY.—The meeting which is to be held at 35, Russell Square, W.C.1, on Tuesday next, November 14, 1922, will be under the control of the Scientific and Technical Group of the Society. Three papers will be read: 1. Experiments on the tensile strength of gelatine and gelatine-jelly; discussion of the results as bearing on the structure of gelatine; with a note on the evolution of heat by gelatine when expanding in water, by James C. Kingdon. 2. Rapid sulphiding of bromide prints. Toning with gases instead of liquids, and demonstration of methods employed. By K. C. D. Hickman. 3. Photo-micrographs in colour, mounted to exhibit changing tints, by D. Northall-Laurie.

A "PHOTOGRAPH OF PETS" COMPETITION.—The "Weekly Dispatch" has started a new photographic competition of interest to professional workers. Cash prizes of over £500 are given for photographs of "You and Your Pet." The competition will run for sixteen weeks, and each week for the best photographs submitted there will be awarded: 1st prize, £5 5s.; 2nd, £3 3s.; 3rd, £2 2s.; with twelve consolation prizes of 10s. 6d. and a prize of £1 1s. to the photographer whose picture is awarded the weekly first prize. At the end of the competition there will be for the best photographs submitted during the competition final awards of: First prize, £100; second prize, £25; third prize, £10. A prize of £5 will be awarded to the photographer whose picture receives the £100 prize. Photographers' special show cards for window display may be obtained free from the "Weekly Dispatch," Carmelite House, London, E.C.4.

PRINTS IN PASTELS.—The name of Dr. Joseph Sury, of Wynghene, Belgium, has cropped up from time to time in photographic literature in connection with the invention of a printing process by which prints in any colour or in several colours may be very readily made. Within the last few days we have had the opportunity of seeing a considerable number of specimens of the process, both monochrome and multicolour, and have been exceedingly pleased with the freshness and vigour of the results. The process consists in sensitising a special paper with a solution containing ammonium bichromate, chrome alum and alcohol. The sensitised paper is printed under an ordinary negative, developed in warm water, transferred to an avid bath, washed for two or three minutes and then hung up to dry. At this stage the image is invisible, and is "developed" by application of pastel colours in powder with a brush. Most striking broad effects are obtainable by the process. In the case of monochrome prints, the manipulation is exceedingly simple and rapid; multicolour effects naturally call for the skill and judgment of an artist. The paper for the process is supplied by Dr. Sury, who may be addressed in this country, c/o Mr. H. Vendelmans, 59, Highbury Park, London, N.5.

PHOTOGRAPHS IN CAMEO RELIEF.—Since mentioning a week or two ago to a correspondent that we knew of no source of supply of photographs in relief, we have had an opportunity of seeing the work of this kind which is being done by Mr. W. A. Whiting, of 51, Eden Street, Kingston-on-Thames, a photographer and artist of many years of experience. Mr. Whiting has invented a process by which, from two portrait prints, he is able to make a cameo relief, in which the likeness is preserved with very great fidelity. The process is applicable only to profile portraits, which may be of any size. Mr. Whiting makes his reliefs of an average size (including bust) of from 2½ to 3 inches, and, in most of the examples which he has shown us, produces the cameo portraits in white on a blue ground, in the style of the jasper reliefs made years ago by the famous firm of Wedgwood. There are, no doubt, many people who would value a photographic reproduction in this relief form. As an inducement for photographers to bring the style before the notice of their customers, Mr. Whiting is prepared to supply one of the reliefs at the charge of 15s., 10s. of

which amount will be refunded on receipt of the first order; that is to say, a specimen of the process will cost a photographer only 5s. after he has placed his first order. The inclusive charge for one of the cameos, mounted in a suitable frame, is £2 2s.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

BACKGROUNDS IN PORTRAITURE.

To the Editors.

Gentlemen,—In common with many professional photographers, I feel grateful for the excellent series of articles now appearing in "The British Journal of Photography," "With a Portraitist in the Studio," and for the assistance given by Mr. J. Effel in reviewing the principles of successful portraiture for his "poseur" brethren.

Having made this acknowledgment in full sincerity, your author will not feel hurt, I am sure, when I also voice my sympathy with him in his many unfortunate experiences with assistants, apprentices, and apparatus, but Chapter IX has given me the opportunity of repaying that debt of gratitude, already expressed, and of also earning a little on my own account from my fellow-craftsmen of both sexes.

One would gather from this article that the use of a scenic-effect background was sufficient in itself to condemn any artist of the camera. It may be true that many ludicrous examples of the use of such effects may be quoted. I myself have seen a photograph of a young man in evening dress, playing a violin in front of a splendid representation of an alpine scene; also a lady swimmer surrounded by trophies and dressed in regulation costume, "back-grounded" by an equally well-painted east-end view of a church with altar and choir stalls. Bad though these two examples are, I contend that they are not worse by one iota than the present tendency to "introduce the curtain" (I beg pardon, I should have written "oak panelling") on every occasion; nor would either of them be more out of place than that of "A Farmer with Dogs and Smock" before the oak panel.

"Oak panel," "sketch," "curtain," or any other style, followed with uninterrupted persistence, would certainly become monotonous, to say the least of it, and photographers would do well to spend a little time and thought, as well as some of the money now squandered on lens collecting, in securing a fair variety of scenic effects and the means of readily changing them as occasion demanded.

Like the camera art, mechanical skill has also advanced since the days of the "Frankenstein monster" and the "octagon," and I myself have seen an efficient and self-contained model with which twelve changes could be effected in one minute without fear of anything going wrong, and about which there are no uncertainties. I believe it will shortly be placed upon the market, though for the moment I am not in the position to give the name of the maker, and it has given me much surprise that your "Journal" has not contained full-page advertisements of this piece of apparatus.

Perhaps Mr. Effel will take up his "cue" and give a good demonstration of the "winning hazard," and thus fill the pocket of many underworked photographers, the "winning hazard," in my opinion, being adaptability of sitter and surroundings.—Yours faithfully,

B. Wheelwright.

173, St. Paul's Road,
West Smethwick, Staffs, November 6.

UNDER-EXPOSED PATCH ON NEGATIVE.

To the Editors.

Gentlemen,—In a reply given to a correspondent (on page 672), it is suggested that a fly on the light-filter may result in a portion of a negative being under-exposed. This suggestion reminds me of a very curious happening some time ago.

Frequently some of my negatives had large under-exposed patches of various shapes and sizes—always one patch, never more, on a negative. The defect occurred at intervals and worried me very much, and letters to plate-makers produced the usual crop of suggestions and remedies.

A careful watch proved that the defect always appeared when a "bulb" exposure of a second or less was given with a roller-blind shutter, and this gave a clue as to the cause. Further investigation proved that when a quick "bulb" exposure was given the tassel hanging at the end of the release cord jerked before the lens opening and so stopped the light—only temporarily, but long enough when a quick exposure was given to show itself upon the plate.

Releasiog the spring of the blind served to do away with the severe jerk (a high tension not being necessary for "bulb" exposures), and weighting the tassel made it doubly sure of hangihg down and not jumping in front of the lens during a brief exposure.

Shutters with tasselled cords are liable to act in this way, but when instantaneous exposures are given there is no jerking, and when long "bulb" exposures are given the jerking tassel is before the lens for too short a time to show on the negative.

This was an unlooked-for cause of trouble, and my experience may be of service to users of blind shutters for quick bulb exposures.—Yours faithfully,

E. Goddard.

THE SKETCH PORTRAIT.

To the Editors.

Gentlemen,—It was with the keenest pleasure that I read and digested the major portion of Mr. Effel's treatise on portraiture. It made one think that at last a man had arrived who would sweep away the silly and ignorant conventions of studio practice.

But alas, when I reached his remarks about white backgrounds, the bottom fell out of all the good I had already imbibed. How can such an unnatural accessory be reconciled with natural and artistic work? Did anyone ever see anyone else (except in a "sketch") floating in white space, denuded of background, foundation or surround? And when a half-tone vignetted frippery design is included on the white background it is infinitely worse from the view point of portraiture, though it might be all right as decorative work.

That white grounds have uses is true. They come in for such widely different specialties as theatrical studies (which are advertisements, not portraits) and machine photographs, but to hold up the taking of 20,000 consecutive portraits against one as an example to the Snappeshottes and Grousers, is inexplicable after reading Mr. Effel's earlier chapters. If he means it, well I fancy that many will stick to their flower pots, wooden rocks, unglazed windows and stormy seas (complete with bear-skin rug and marble pillar).—Yours sincerely,

J. R. Hall.

31, August Road, Liverpool.
November 6.

A DARK-ROOM LIGHT FOR BROMIDE PAPER.

To the Editors.

Gentlemen,—The letter from your correspondent "Hyperion" in your issue of the 27th ultimo, and the subsequent letters on the same subject in your issue of last week, raise a point which we think is worthy of further consideration. "Hyperion's" results, as suggested by Mr. Hall, may be due to the fact that he was using a red glass which passed some violet, but it is by no means impossible that his results were due to a property both of plates and bromide paper which is too little recognised.

As is suggested by "Hyperion," there is a definite red-sensitiveness of nearly all emulsions both plates and bromide paper, apart from such emulsions as have been specially colour sensitised. Although this red-sensitiveness is of no value in the normal use of the plate or paper, it is of very serious consequence when designing dark-room light-filters.

It was found, many years ago, when the subject of the construction of dark-room light-filters was taken up by us, that this red-sensitiveness varies considerably between different makes of plate and bromide paper, but that it is in all cases sufficient to make it an advantage to depress the red rather than the yellow-green in a light-filter intended for ordinary, non-colour-sensitised materials. Such a light-filter is still quite yellow in appearance. The Ilford "S" (for slow plates and bromide papers) and "F" (for fast plates) dark-room light-filters are, in fact, made in this way. It has not been definitely ascertained whether these emulsions have actually greater sensitiveness in the red than they have in, for example, the yellow-green, but even if this is not the case, the

very much greater luminosity value of the yellow green would easily account for the greater efficiency of light-filters constructed on these lines.—Yours faithfully,

ILFORD, LIMITED.

November 6.

THE EFFECT OF DEVELOPMENT UPON GRAIN CLUMPS.

To the Editors.

Gentlemen,—In the "British Journal" of 1922, p. 443, Mr. F. C. Toy published some remarks concerning Silberstein's quantum theory of photographic exposure, and more especially Righter's and my own experimental investigations, criticising our results as based upon faulty interpretations and as experimental tests of the aforesaid theory.

In the first place, I should like to refer to a recent paper by Righter, Sheppard and Trivelli in the "Phot. Journ." (Vol. 62, 1922, p. 407), in which some of Mr. Toy's criticisms have been met in advance.

Slade and Higson (Proc. Roy. Soc., Vol. 98, 1920, pp. 104-170) rejected the development of clumps as units, basing this rejection upon the microscopic observation that on several occasions only one of two grains placed near to each other side by side or above each other developed while the other remained unaffected. On the other hand, we found that the reverse was generally true, and that the grains when clumped together act as one grain for development to the limit.

We had often observed cases where grains apparently in contact did not develop together, but in many of our emulsions these were few compared with those that developed in clumps. For instance, plates were prepared with our experimental emulsion W—12—C, in which the incomplete clump development, as mentioned by Slade and Higson, was almost entirely absent (type A, used for testing Silberstein's theory), and with the same emulsion, other plates showing strongly the incomplete clump development (type B). The different properties of these two types depend probably upon the cooling and other conditions of the coated emulsion. In both cases the grains in a clump were, all at the same time, sharply focussed in the microscope, with a magnification of 2,500. However, the single grains could all simultaneously be sharply focussed in the case A, but by no means so in the case B.

In both cases we are concerned with the dried emulsion layers after the development. The gelatine of the emulsion swells in the developer in a direction perpendicular to the plane of microscopic focussing. Therefore, even very small depth differences of the grains in the dry layer are enlarged in the developer, subsequent to coating, and it depends on this effect whether a grain will be found in a clump or not.

Now, some of our preliminary measurements have shown that the developed grain has a larger projected area than the intact grain. Thus, for instance, the projected area of some grains was found to be enlarged 1.2 times in a pyro developer. It was reasonable, therefore, to expect the existence of clump development. Actual displacement of a grain by reduced silver has thus far never been observed. It may perhaps be assumed that the thin gelatine layer surrounding each grain is penetrated by the silver, which is an easy matter in swollen gelatine, and which is also corroborated by the fact that every completely developed clump appears, even under the highest resolving power of the microscope, as *one* continuous mass of black silver.

The simultaneous focussing of all the grains of a clump cannot, therefore, be considered as the decisive proof that one has to do with a real clump, and not an apparent one. A discrimination between the two can be obtained only by a complete quantitative investigation of the behaviour of clumps (real or apparent) and of single grains in the developing process.

Mr. Toy has attempted to explain our curves from the standpoint of the development of single grains by means of probability considerations. With these, however, I am unable to agree. The clumps are not so regularly built up, that, for instance, at the development of a single grain out of a clump of six, the latter should be converted into a united clump of five grains. It would, in general, be split into two separate parts. The clumps show variety of configurations, and these latter influence the way a clump is split into parts. Thus, e.g., a chain of six grains, on losing one grain, may be converted into either

1 clump of 5 grains,
or 1 clump of 4 grains, and 1 single grain.
or 2 clumps, one of 3 and one of 2 grains.

From the standpoint of single grain development, it would be altogether impossible to construct with our data a clumping curve of the developed grains. The writer has tried to construct a clumping curve of the developed grains by means of the coating B, mentioned above, of which he has taken as many as 99 micrograms with over 11,700 measured and classified grains. As a result, while the single grains gave a smooth curve, it was utterly impossible to obtain any regularity with the clumps. On the other hand, Righter and Trivelli were unable to obtain smooth curves for the single grains from the data concerning the coating A, which behaved regularly with respect to the clumps.

It must be kept in mind that the clumping tendency is much stronger in the case of large flat grains than in the case of smaller and round ones, which among other things are prevented from coming into actual contact by the Brownian movement. The former case corresponds, of course, to plates and films of high sensitivity. Now, when a thin section is made of such a plate or film by means of a microtome and investigated microscopically, a very large number of developed clumps is found, sometimes of a prodigious size, and equivalent to an aggregate of a hundred or more grains. Is it possible to imagine that all these black clumps arose by each of their grains being affected by light, while of all the neighbouring single grains only a very small percentage was thus affected?

I am therefore of the opinion that although single grain development may take place where apparently contiguous grains exist, yet the development of clumps is also frequently shown by emulsions, and that in the plates which we used almost all contiguous grains developed in clumps. It would follow that conclusions as to the sensitiveness of the clumps would be valid for use in the testing of theories of exposure.

My thanks are due to Mr. Toy for his kindness in calling attention to this matter.—Very truly yours,

A. P. H. TRIVELLI.

Eastman Research Laboratory,
Rochester, N.Y., October 25.

THE KEEPING PROPERTIES OF AN M-Q DEVELOPER.

To the Editors.

Gentlemen,—In June, 1914, I made up an M-Q developer for lantern plates to the formula of Messrs. Wratten & Wainwright, namely, metol 10 gms., hydroquinone 5 gms., sodium sulphite (cryst.) 100 gms., sodium carbonate (cryst.) 100 gms., water to 2,000 c.c.s. A portion of it was bottled in one-ounce stoppered bottles with perfectly-fitting glass stoppers and kept unopened until to-day.

Upon comparison with a freshly-compounded developer of the same ingredients it was found to have suffered slight discolouration, amounting, however, to a mere pale brownish tinge.

A lantern plate (Paget "slow") was exposed behind a step plate of known densities, the steps being in the form of bars completely across the narrow diameter of a quarter-plate. The lantern plate so exposed was cut longitudinally into two halves. It was assumed that each half had received an identical series of exposures transmitted by the steps of the step plate.

The following data were obtained after development at a temperature of 65 deg. F., kept constant in a thermostat throughout development:—

Densities of the step plate.	1914 M-Q. Densities (diffuse).	1922 M-Q. Densities (diffuse).
Fog strip ...	0.00 ...	0.00
2.150 ...	0.050 ...	0.050
1.675 ...	0.175 ...	0.175
1.125 ...	0.600 ...	0.625
0.700 ...	1.025 ...	1.050
Time of first appearance of the image ...	4½ secs. ...	6½ secs.
Total time of development ...	50 secs. ...	70 secs.
Watkins' factor ...	11 ...	11
Approximate Gamma (contrast) ...	1.0 ...	1.0

In both cases the developer was diluted with three times its bulk of water in order that the time of first appearance of the image could be determined more readily, and development was arrested by plunging the plates, without washing, into cold acid "hypo." I am at a loss to explain why the older solution should possess the greater activity, unless it be that the ingredients in 1914 differed somewhat markedly from those used in 1922. In 1914 the metol and

hydroquinone were of German manufacture, and the sulphite of soda and carbonate of soda were both of the crystalline variety and of unknown purity. In 1922 I used Elon and hydroquinone (Kodak) and an anhydrous carbonate of soda (monohydrate) with an equivalent weight of 124 compared with 286 for the crystalline salt. Titrated with acid the alkalinity of the 1914 solution was the same as that of the 1922 solution.

It would, at any rate, appear that an M-Q developer properly compounded and kept in an air-tight full bottle retains its developing properties to a remarkable degree. And it is interesting to note that the time of first appearance of the image, an event the importance of which but few photographers recognise, was an accurate guide to the speed of development. With this developer a Watkins factor of 11 will reproduce the contrast of the original.

Yours faithfully,

Sunnymere, Birkenhead Road, Meols. B. T. J. GLOVER.
November 6.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

S. W. N.—The celluloid buttons are a specialty of Messrs. Dorrett & Martin, 16, Belle Vue Road, Upper Tooting, London, S.W.17.

S. G. H.—We do not know what has become of him. For some years past he has not replied to our annual circular sent out for the compilation of the directory of the photographic trade in the "Almanac."

V. M.—We have not reprinted in book form any of the articles on docketing systems for the studio. The most detailed description of such a system was that recently given by a contributor, "Pelham Swinton," in the "B.J." of May 19 and May 26 last. These copies can be supplied by our publishers, price 9d. each, post free.

A. A.—We have seen the displays in the showrooms of the General Electric Company of the daylight half-watt lamps, but we have not had any of the lamps sent to us by the company. Inasmuch as the principle of the lamp seems to be a screening of the light of the ordinary Osram filament, we cannot imagine that the lamps can possibly reduce exposures in comparison with ordinary half-watts of the same wattage.

H. S.—We are quite sure that to make a good job of the book plates there is no better process than carbon. When you have your design you could send it to the Autotype Company, 74, New Oxford Street, London, W.C.1, who could make a negative of it and print in any colour of carbon tissue. They have some 30 or 40 different colours, among them a number of grades of blue.

A. H.—(1 and 2) The type of softness obtained direct in the camera by the use of a soft-focus lens takes a form which has a distinctive effect of roundness, while that obtained in enlarging a sharp negative with a soft-focus lens is merely the softening of lines. (3) Most of the well-known lens makers supply soft-focus lenses, and you should write to them for their booklets, which describe and illustrate the work of such lenses. (4) The Kodak diffusion disc may suit your requirements. Particulars of this attachment may be obtained from Messrs. Kodak, Ltd., Kingsway, London, W.C.2.

S. B.—It is just possible that contamination of the sulphide bath with traces of alum may have some effect in favouring the staining of the cards, but we would not describe its influence in stronger terms than those we have just used. We think it is more likely that the stain arises from insufficient fixation of the cards. If we were you, we should revise your procedure to the extent of passing all cards through two fixing baths in succession, leaving them in each for at least ten minutes. As soon as bath No. 2 has been in use for any considerable number of prints it should be made bath No. 1, and fresh full-strength fixer brought into use as No. 2. We are inclined to think that if you devote this special attention to full fixation you will not experience the staining of the highlights.

A. V.—So far as concerns the photographs of the buildings, we imagine that the copyright in them was the property of the previous photographer. You have certainly not acquired the copyright in them, and both in copyright law and common law the previous photographer, we think, can restrain you from showing the prints on your premises when, presumably, they would be represented as your own work. We dare say he could also restrain you from selling them. As regards the portraits, the circumstances are more complicated. We must assume that the portraits were taken in the ordinary way of business, and that, therefore, the copyrights belong to the respective sitters. These latter, if they are so inclined, may object to the exhibition of the prints and have the right to restrain you from exhibiting them. We should think the simplest thing would be to write and ask their permission.

S. S. C.—The copyright in the photograph of the church has certainly been infringed, and the church authorities, who ordered the production of the handbook by the printer, are equally liable with the printer in respect to the infringement, so also are any traders who sell the handbook. We should think your best course would be to write to the secretary of the bazaar, pointing out the infringement and his liability in the matter. The Act authorises you, by taking action, to obtain delivery to you of all the infringing copies of the publication. In these circumstances no doubt the secretary will be only too anxious to rectify what may have been an oversight. You should ask him what he proposes to do about the matter. Do not ask for any particular fee. As a rule, photographers whose work is infringed in this way are ready to accept in satisfaction twice the fee which they would have charged had they been approached in the first instance.

S. B.—(a) Apart from the illustrated daily and weekly Press dealing with news events, it is customary to send direct. And it is better to do so, since the agents have their rounds, which very often do not include the more specialised journals. As regards illustration of poems, you might send a dozen or so prints of a kind which could be used for this purpose, and at the same time intimate that you are ready to take photographs for illustration of a particular poem or story. A book which would be of great use to you is "The Writers' and Artists' Year-Book," published by Messrs. A. & C. Black, Ltd., 4-6, Soho Square, London, W.1, price 3s. 6d.; also Willing's Press Guide, published by Messrs. James Willing, Ltd., King Street, Covent Garden, London, W.C.2, price 2s. (b) As regards photographs for advertisements, almost all these are prepared by a firm's advertising agent. You can only discover which agents deal with a firm's regular advertisements by studying the advertising Press, such as "Advertiser's Weekly," 66-67, Shoe Lane, London, E.C.4; "Advertising World," Sardinia House, Kingsway, London, W.C.2; and "Sales Management," 34, Bedford Street, London, W.C.2.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. PRICE FOURPENCE.

TERMS OF SUBSCRIPTION POST FREE.

UNITED KINGDOM OR CANADA.—*One Year*, £1 1s. 8d.; *Six Months*, 10s. 10d.; *Three Months*, 5s. 5d.

ANY OTHER PART OF THE WORLD.

One Year	£1 3s. 10d.
Six Months ...	12s. 0d.
Three Months	6s. 0d.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibits the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3263. Vol. LXIX. FRIDAY, NOVEMBER 17, 1922. Price Fourpence.

Contents.

SUMMARY

In a contributed article Mr. A. E. Bawtree describes some methods which, while saving time, do so without sacrifice of accuracy. They relate to printing of margins, making of solutions, cutting plates to size, etc. (P. 691.)

In a recent lecture before the Master Printers' Association, Mr. W. Gamble gave an excellent account of the advances which are being made towards the substitution of photographing machines for those now employed in type-composing for letterpress printing. He described what has actually been accomplished in this direction, and showed its relation particularly to offset and intaglio methods of printing. (P. 692.)

At the Royal Photographic Society, on Tuesday evening last, Mr. K. C. D. Hickman described a method of sulphide toning with gaseous reagents, namely, bromine or chlorine, and hydrogen sulphide. The process was put forward as adapted for the continuous toning of photographic images by mechanical means. (P. 701.)

In an article by J. De Witt Kreps, contributed to "American Photography," the author gives many useful hints by way of introduction to the practice of the ordinary retouching of negatives with a pencil. (P. 698.)

In the use of half-watt lamps care should be given that the bulb is in the position intended by the makers, that is to say, with the socket immediately over the filament. (P. 689.)

We refer to a remarkable example of the trade done in connection with the development and printing of amateur film, namely, the making of nearly 30,000 enlargements within a period of eight months in a single business. (P. 689.)

A camera for the making of portraits to be delivered immediately to the customer is the subject of a recent patent specification. (P. 699.)

In a leading article we refer to some of the appropriate ways in which the photographer's showcase or window may be dressed with specimens appropriate to the season, and thus more effective in attracting business. (P. 690.)

Lenses may readily be fitted for temporary use on a camera by one or other of the devices described on page 690.

Practical details of the method to be followed in eliminating the dot effect when copying an impression from a half-tone block are given in a paragraph on page 690.

Full exposure and development, followed by the use of the iodine-cyanide reducer, is probably the best way of dealing with stale bromide paper—better than the use of a restoring solution. (P. 690.)

EX CATHEDRA.

The Position of Glow Lamps. The daily increasing use of incandescent electric lamps for portrait work and enlarging renders it necessary to point out to those who are fitting their own half-watt installations that the life of the lamp depends greatly upon the position in which it is fixed. It is, of course, supposed by the manufacturers that the lamps will be fixed in a pendant position, the socket being immediately above the lamp. The interior of the bulb is so arranged that the filament is most effectively supported in that position. Moreover, the higher powered lamps generally used for studio work have an arrangement by which any volatilised matter from the filament is condensed in the neck of the bulb if the latter is kept in its normal position, thus deferring to an appreciable extent the blackening of the bulb in the neighbourhood of the filament. Fortunately it is usually easy to fix the lamps normally for portrait work. In the case of enlarging lanterns, a mirror fixed at an angle of 45 deg. below the lamp will allow the circle of light to be directed to the condenser. Surely it is time the manufacturers gave us some small half-watt focus lamps for fairly high voltages.

* * *

Enlargements and D. & P. While it is generally recognised that the business of developing and printing the film spools of amateur photographers runs into large figures, and during the last year or two has proved one of the most profitable branches of the photographic trade, we imagine that many people still fail to appreciate the magnitude of the business which passes along these channels. A vivid side-light on the business is shown by an article in the current issue of the "Kodak Trade Circular," in which is an illustrated interview with Miss Elsie Graham, an employee of Mr. A. E. Marriott, of Hastings, who is responsible for the production of the enlargements which are supplied by Mr. Marriott, largely, we believe, in connection with the latter's business of developing and printing film spools. Within a period of eight months Miss Graham has made enlargements to the number of 29,524. The total is in itself a testimony to the capacity for output of the Eastman projection printer, with which the work has been done, but we should like to underline its significance in relation to the great volume of business which follows in the train of the use of daylight film cameras. After all, the making of enlargements is only a branch of the D. & P. trade, and probably there are not many people in the country who have developed it to the proportions which Mr. Marriott's output represents. The enlargement side of the business is, however, one which is capable of very great expansion, as, indeed, we discussed in an article a few weeks ago, written before the present record, as we imagine it to be, had come under our notice. In the early days, professional photographers held aloof from

this business, but many of them are now realising their mistake, and are seeking to get their share of it. Fortunately, owing to the modern developments of appliances for the business, it can now be taken up under immensely better conditions even than was possible five years ago.

* * *

Copying Half-tone Originals. There are different ways of obtaining a negative from a half-tone reproduction so as to get rid of the dot effect; all the methods, however, have a tendency to soften the reproduction and reduce the contrast. One of the best methods is to take a piece of acid-etched ground glass and smear the matt side with vaseline and polish off until all smears and greasiness have disappeared. The ground glass thus prepared is laid on the copy, matt side outwards, and then slightly drawn away until the dot effect disappears. The distance which is required depends upon the screen with which the original was made; it is usually about 1-16th to an 1-8th of an inch. The distance is retained by inserting a thin piece of card of the required thickness between the original and the ground glass. A fine "Metzograph" screen will give the same result with greater sharpness than is given with the ground glass. The dot effect can also be eliminated by putting the copy slightly out of focus, or by tapping the camera during exposure. Soft-focus effects can be obtained from hard outlined originals by the first method, but the negative should be fully exposed and well developed.

* * *

Temporary Lens Fitting. It is often necessary for the technical photographer to extemporise some form of holder for a borrowed lens or for one which time does not allow to be properly adapted. The iris grip holder which, we believe, is now again to be obtained in the ordinary way, is a very efficient solution of the problem, but it is unfortunately rather clumsy and therefore not adaptable to light cameras. In such cases it is necessary to fall back upon the old device of a rather thin but hard cardboard front cut out so as to fit closely up to the shoulder of the body ring thread and, after placing it in position, to clamp it by screwing the flange on the other side of the card. The card may be cut to fit into the camera front or may be fixed with drawing-pins upon a wooden panel. If the flange be not available, a stouter piece of card may be used and the lens screwed into the hole, which should be a tight fit. With heavy lenses such as large anastigmats and portrait lenses, a thin wooden front with an opening just large enough to take the screw thread should be made and the lens secured in its place with three or four small wooden buttons which will grip the rim in front of the body screw. A lens of 4½ inches diameter may be usefully held in this way without a flange.

* * *

Utilising Stale Bromide Paper. Although when properly stored, bromide paper will remain in good condition for a considerable period, it sometimes occurs that some long-kept stock is found incapable of giving a clean print. A muddy grey fog pervades all the high-lights, and in addition there is often a somewhat metallic stain round the edges. The best way of dealing with such paper is to give a full exposure and development and, after the usual fixing and washing, to clean up the surface with a very weak iodine and cyanide reducer. This is best applied by means of a fairly large pad of cotton-wool instead of immersing the print in a dish, since not only is less solution required, but it can be applied locally to any obstinate stain without endangering the rest of the subject. If the image is fairly strong, there is little risk of destroying any of the delicate half-tones before the fog is removed. Only a few minutes' washing is necessary after the clearing. It is rather important that a fairly pure sample of cyanide be used, since some of the common qualities as sold for non-photographic purposes are of themselves liable to cause a yellow stain. No doubt bromide paper can be improved for printing, though at the expense of its speed and gradation, by treating it with one or other of the restoring solutions which have been recommended, such as those containing permanganate. But for anybody whose time is of any value the game is scarcely worth the candle. After all has been said and done, the preventive of staleness is in the photographer's own hands. If the conditions of storage are unduly severe through damp or heat, a good-sized tin trunk may be set apart for containing the stock of bromide paper in a cool place, and the internal atmosphere of the box kept dry by putting a few pounds of calcium chloride inside.

SEASONABLE SPECIMENS.

Most photographers are alive to the necessity of making a special display as Christmas approaches, and some even rise to the occasion to the extent of adding to the attractiveness of such a show artificial holly and genuine cotton wool. The more discerning, however, realise that after all it is the pictures that matter, and that a descent to the level of the toyshop is neither dignified nor profitable. Moreover, the Christmas decorations cannot be put out sooner than the beginning of December, which is rather too late to start the Christmas trade. A better plan is to arrange, week by week, a special show of some subject appropriate to the season. Let it be fancy-dress portraits and groups one week; ladies in furs the next, and home flashlight groups for a third. In addition, local celebrities and happenings may be pressed into the service, the one object being to make the window attractive.

Such displays need not necessitate a great amount of work, since half a dozen subjects in a fairly large size should be enough for each. Again, it may be pleaded that suitable negatives are not on hand. In such case, the obvious remedy is to make them. It should not be a difficult matter to enlist the sympathies of the local draper or furrier by pointing out that a display of photographs of fur-clad ladies is likely to stimulate the demand for his goods, while he could possibly help still further by providing young lady models, who would feel amply recompensed by a few prints. Child pictures are always a certain draw, but these should be kept separate from grown-ups, or they lose their appeal.

So far, there is nothing very Christmassy in the idea, but once interest in the studio is excited the suitability of photographs as gifts is easily demonstrated. One difficulty which arises is that many people feel that a photograph is rather a mean gift to offer, but this may be overcome by adding to it an appropriate frame, case or wallet. The narrow mouldings now in vogue make extremely tasteful yet inexpensive frames, and there is no reason why, by adding a seven-and-sixpenny frame to a cabinet, it should not be regarded as a worthy present. For some unknown reason many photographers entirely ignore the possibility of selling frames, while others make a satisfactory addition to their turnover by pushing them. It is the same with pocket cases and wallets. Why should customers have to go to a stationer's to get these, often in unsuitable styles and colours, when the photographer could supply just the right thing?

It is difficult to lay too much emphasis upon the importance of exhibiting specimens or samples of the highest possible quality. In ordinary commerce, where goods are sold from samples, there is a warranty, written or implied, that the bulk is equal to the sample. It is only the photographer who is sometimes foolish enough to use rejected proofs and faulty prints to show the quality of his work. Far better is it to make an extra print on each order from such negatives as may appear to be suitable, and to choose the best and not the worst of the dozen as a specimen.

Suggestions as to window dressing have already been given at sufficient length by many writers, but it may not be out of place to say here that the worst of all faults is overcrowding. When a window is crowded with portraits it is difficult to see the good points in any one of them. One is simply conscious that it is a photographer's, and if there is any pressing need for a portrait, one enters, that is, if not too critical.

As in all other businesses, it is a paying proposition to show from time to time some special line, and to suggest that quite the same thing cannot be obtained elsewhere. Such things as inexpensive miniatures on real ivory, ceramic enamels, special styles in framed enlargements, are all suitable for presents, and the busy photographer need only take the negative and leave the rest to a good trade house.

It is, perhaps, hardly necessary to point out the advisability of keeping the window display uncovered and lighted up as long as there are any possible customers about. Young couples are good friends to the photographer, and it is well to give them a chance of seeing what can be done in the way of photography after their own business hours are ended.

While it is not always desirable to undertake what is now called "amateur finishing," some photographers have found it worth while making carefully-finished monochrome or coloured enlargements from amateur negatives. It has happened more than once that a snap of a favourite dog or horse has resulted in an order for an oil painting as a birthday or Christmas present to the owner of the animal.

TOUCH *v.* SIGHT IN PHOTOGRAPHIC MANIPULATION.

At first sight it would scarcely seem possible to suggest a greater contradiction than that operations in the one process dependent upon light could be better performed by touch than by sight. Yet this is true in certain fields. Obviously one cannot judge the colour of toning or the extent of development by means of the fingertips, but whenever repetition work has to be done, and in many cases in which speed of operation is concerned, the hands are the best guides.

This principle is very widespread in factory work. In all metal stamping machines the sheet is placed in position against stops by touch. For filling bottles with patent medicines, hat polishes and so forth, each bottle is placed in turn in the angle of a right-angled guide to ensure that the small mouth shall come exactly under the delivery spout of the filling machine. Even more closely associated with the photographic industry is the matter of commercial colour printing. Here each working is made to register with the last, not by placing the sheet with a mark opposite one on the board of the machine, as is often done in multiple carbon printing, but by pressing each sheet home against a rule along one edge and a stop which touches a second edge of the sheet. Having once set the stops, far superior register is obtained than could possibly be secured by eye, and every sheet is positioned just as quickly as the operator can handle it.

The first application of the method of touch is similar to that just described for colour printing. It has reference to the narrow white margin which serves in lieu of mounting in the case of the thousands of prints turned out by those firms who "develop your films and let you have prints in 24 hours." Masks are cut in sheet zinc, as thin as possible, say of No. 6 zinc gauge, having openings a little smaller than the exposed portion of the various sizes of negatives to be handled. These openings should be about a quarter of an inch smaller each way than the sensitive paper, which is obtained cut to size in gross boxes. About one-eighth of an inch from the opening strips of thin card are glued to the zinc on all four sides, extending to within a quarter of an inch of each corner; this card thus forms a shallow trap, which will just hold the cut sensitive paper and at the same time permit it to be lifted out by a finger-nail under a corner. The print is thus automatically masked with a margin of uniform width of an eighth of an inch. The edges of the paper become slightly frayed in manipulation, and the final trimming is done on a well-known type of trimmer, designed for post cards, which automatically takes off a sixteenth of an inch from the sheet, just as quickly as the hands can move, and without any adjustment by eye at all. The saving of time by this method is considerable, amounting to about fifteen seconds per print, or an hour for every twenty dozen. At the same time the consumption of sensitive paper is reduced to the absolute minimum.

When black margins are required, a course adopted by the more artistic "D. and P." concerns for prints from the many flat, over-exposed negatives with which they often have to deal, the print is first made from the negative without any mask at all. Upon a piece of glass of, say, half-plate size, two strips of thin card are pasted near two adjacent sides and truly at right angles to one another. A piece of carefully trimmed black paper is affixed also to the glass, leaving a space of one-eighth of an inch between it and the two pieces of card. Thus the only uncovered portion of the glass is an L-shaped line an eighth of an inch wide. The printed paper is placed against the card strips, and a short exposure given. It is then turned so as to bring the other two sides against the strips, and a second exposure made. When developed and dried any roughness of edge is trimmed off with the automatic trimmer above referred to.

The making up of photographic solutions by touch saves a lot of time. Tin canisters, thimbles, potted meat pots and other small receptacles can be adjusted to hold the required weight when filled level with the top, labelled with the weight and nature of material and all weighing of chemicals for regularly used recipes thereafter saved. For example, a canister 3½ in. high by 2½ in. in diameter, filled with hypo crystals and tipped into a one-quart bottle, which is filled up with water, makes a 25 per cent. hypo solution. Tin or cardboard vessels can be cut down to the sizes required, while pots or thimbles can be partially filled with wax in order to obtain adjustment. A mixture of beeswax, 3 parts; rosin, 1 part; and brick-dust, 1 part, is ideal for the purpose.

Compounding developers, toning baths and similar mixtures from stock solutions can be similarly expedited. In place of carefully filling a measure up to the line with each component in turn, a far less costly tumbler or cup is used to hold the bulk, and small glass or china measures are used for the components, each of which has to be filled level with the top to

secure the proper amount. Egg cups, wine glasses, small fancy jugs and pots from the china shop and other odd vessels can readily be found to hold the correct amounts, and should be plainly marked in bold Brunswick black letters with their containing power when brim full. Not only is much time saved in daily work, but actually greater accuracy is secured, and therefore better uniformity of work, than when the ordinary graduated measure is employed.

The distinction of bottles by touch is preferable to the best labelling, though, of course, the bottles should be labelled in addition. What photographer is there who has not many a time taken up the wrong bottle because it was of the same size and shape as the one required? A row of uniform Winchesters and similarly sized and shaped reagent bottles may look very nice, but a miscellaneous assortment of glassware from grocer and oil shop will conduce to better and more certain work.

In multiple-gum or any other type of printing in which successive impressions are put upon the same print, adjustment by touch gives more exact results. If a picture is being copied fine lines should be marked near two edges, while where this is not possible, as with landscapes, lines should be drawn upon each negative between definite points on two adjacent edges of the negatives. Strips of thin card can then be pasted up to these lines, and will give perfect register stops for all printings.

For studio work and experimental photography very much expense can be saved by making all trial exposures on half quarter-plates. The writer has cut thousands, possibly tens of thousands, of plates up into various sizes both for the above purpose and for other cases of plate economy. When, for example, a number of narrow negatives have to be made, it is well worth while cutting plates especially for the purpose. In his recent exhibit at the R.P.S. 24 negatives were required of a length of 8 in., but only containing an image an inch wide. Whereas the general plan would have been to use whole plates for these, plates were employed only one-third of a whole plate in width for these results. Thus only eight were required, and sixteen saved. With plates at their present price this economy is very marked. The little appliance for cutting by touch is easily made as follows:—From a local printer obtain a few feet of "pica wood furniture." Also obtain a small drawing-board, say a foot square. Along two opposite edges of the face of the board glue strips of the furniture. Cut a third strip long enough to reach right across the board to the outer edges of these two strips. Secure the strip at one end on the top of one of the fixed strips, so that its outer edge comes to within a quarter of an inch of the edge of the board. Swing the strip by the other end till it is exactly at right angles to the strip, to which one end is screwed, and then secure the other end to the face of the other strip. This third strip will now form a bridge the whole length of the board, under which glass plates can be slipped. If the plate is pressed against the nearer edge to the operator (to which the strip should be strictly at right angles) a cut with a diamond guided by the bridge will cut the plate square across. Draw the cutting diamond alongside the bridge, making a mark on the quarter-inch wide margin of the board which projects beyond this edge. Now mark the board every quarter of an inch from this mark, and impress these marks deeply into the wood with a screw-driver or blunt chisel. Make each inch mark twice as long, and plainly mark the inches. Eighths and sixteenths can easily be judged between these marks. As an example of the use of the board; suppose it is required to cut whole plates up into three approximately equal strips, stick an ordinary pin firmly into the wood at the distance $2\frac{1}{8}$ in, full. Take two plates face to face, place them with one of the $6\frac{1}{2}$-in. sides against the near strip of wood, and one $8\frac{1}{2}$-in. edge touching the pin, and make a cut with the diamond. Turn the two plates through half a revolution and make a second cut. Turn the two plates over and repeat the two cuts, when the plates can be broken into six strips of the widths desired. The writer always uses this device for plate-cutting in total darkness, only using light for setting the positions of the guide pins.

When prints or sensitive paper have to be cut to uniform size, adjustment on the trimmer by touch is quicker and more accurate. Strips of thin card should be pasted down on the board of the trimmer parallel to the knife and at the desired distance from it. A number of charts have been prepared, each containing nine rows of twelve separate pieces of coloured paper, two of which charts appeared in the writer's exhibit at the R.P.S. last year. These little 1-in. squares fitted with beautiful accuracy, and were all cut by touch in the manner above indicated.

Other examples of the idea might be given, but enough has been said to indicate the possibilities of work by touch rather than by eye. It can be laid down as a general rule that whenever touch can be substituted for sight there will be substantial gains both in speed and in uniformity of results.

A. E. Bawtree, F.R.P.S.

THE INFLUENCE OF PHOTO-OFFSET AND ROTARY PHOTOGRAVURE ON THE FUTURE OF LETTERPRESS PRINTING.

[At a recent meeting of the Master Printers' Association Mr. W. Gamble read a paper in which he gave a very interesting description of the progress which is being made in the application of photographic methods to the production of letterpress. For some years past several inventors have been busy in the design of machines akin to those now employed in typographic work, but designed to produce photographic negatives instead of the matrices from which type is cast by such machines. The inventions open up revolutionary methods in the production of letterpress, particularly in relation to printing by offset and photogravure methods. The lecture, the chief part of which, by courtesy of Mr. Gamble, we are able to print, shows the various ways in which progress is being made, and foreshadows the changes which may come about in the printing industry as the outcome of the substitution of photographic for mechanical methods.]

The increasing use of photo-processes for various kinds of printing and the great improvement which is being continuously shown in the results of these methods, especially in connection with offset printing, are leading letterpress printers seriously to ask the question how these developments are going to affect their branch of the printing industry. I propose to address myself to answering that question so far as it is possible to do so in the light of present knowledge. To answer it completely would require the prescience of a prophet, for no one can exactly foresee how these new processes will eventually develop. One can only indicate by deduction and inference the direction in which they may tend.

So long as these photo-processes were confined to the production of illustrative matter, whether by blocks or by lithography or by photogravure, letterpress printers did not view them with any alarm, but rather looked on them either as a valuable auxiliary to their business or as useful for special purposes outside

the province of typographic printing. But when it is seen that an increasing amount of text matter is being printed by offset and rotary photogravure, and that the results are very good, even being preferred by some customers, letterpress printers naturally begin to ask where they stand, and what is the future going to bring forth.

At first they consoled themselves by the reflection that so long as the type had to be set before it could be used for either offset or rotary photogravure there was not much to fear, as there could hardly be a great difference in cost. When, however, there were rumours that before long it would be possible to compose text-matter without setting type the trade began to "get the wind up," as the saying goes.

In the last two or three volumes of "Penrose's Annual" I have given evidence that inventors are at work on such methods, and that some of them have actually achieved pretty good results. I also warned the trade what was coming in my address to the World's Printing Trades Congress held at the last Printing Exhibition, but my remarks were viewed with scepticism. I am able to show you some proofs of the work of Mr. Arthur Dutton, of Liverpool, which I think you will agree are very good evidence that progress is being made towards the realisation of this idea of composing without type. You will see that he is able to compose either display or solid matter and ornamental borders, that he can justify his lines, and that from one set of master letters equivalent to a face of type he can get any size in the point scale. You will also see that the alignment is good, and that the lettering is clear and sharp. I am not permitted to tell you how it is done, but I have seen the apparatus at work, only a rough model, yet sufficient to produce the remarkable work I am showing. It only needs the construction of an apparatus hardly more complicated than a typewriter, and certainly far more simple than a linotype or monotype.

There is also on the market already in New York an apparatus called the "Deastype," which produces very good display matter in the form of copy for the engraver or photo-lithographer, but it does not seem adaptable for solid text.

You have all no doubt heard of or read about the patent of Messrs. Robertson, Brown & Orrell, which emanates from the house of Robertson of St. Annes, the firm who have made themselves famous for the production of the "Blackpool Times" and the "Sunday Express Supplement" by offset printing. Their apparatus is to be something like a linotype machine in appearance, only instead of matrices there are little frames of metal containing glass negatives or positives of the letters of the alphabet. When a key is touched a letter comes down, and thus a line of letters is built up. Then the camera comes into operation, a beam of light is directed through the glass letters, and an exposure made. The camera makes a step, and the next line is set up and similarly photographed. So the operations go on until a column or a page is composed. The photographic images are reviewed on a celluloid film in negative form, so that as soon as the film is developed it is ready for printing down on zinc.

I know the question will be asked, "What about corrections?" Well, that can be done by cutting out a piece of the film, just as the cinema man cuts out portions he does not want and joins up again. There is no difficulty about that. I can see some other difficulties which all inventors in this field will meet with, but I do not think they are insurmountable. When you think of the marvellous results which have been achieved by the cinematograph, and the perfection of mechanism attained, I do not think we can look upon photo-composing as a more difficult problem. Or, again, it is not one-quarter, perhaps not one-tenth, as difficult as the work which has had to be done in perfecting the linotype, the monotype, and other type-composing machines.

Do we realise what the change portends? If there is no type to be set a whole lot of things go overboard with it. There will be no type casting, no stereotyping, no electrotyping, no block-making wanted, and if these things go so also goes the greater part of letterpress printing machinery. What a colossal change it will be!

I am told that in a certain printing works employing some 50 to 60 compositors and monotype operators, the capital outlay involved in type and metal amounts to between £8,000 and £10,000. There is also an equipment of three monotype keyboards and casters which, with the stock of matrices, have cost £4,000 to £5,000. Say in round figures, there is a capital outlay due to type setting of £15,000. Suppose this was replaced by photo-composing machines. I reckon that such apparatus could be sold for about £250 to £300 per unit, but, of course, there would be some additional outlay for the master alphabets for the photo-composing apparatus, but it will be nothing like that for matrices, because one alphabet for each face will yield any point size by reduction of the image with the camera. If we put the cost of the alphabets at £50 more, we have a cost per unit of £300 to £350. Now it is difficult to say how many units would be required to replace the work of 50 or 60 men doing monotype and hand setting, but suppose 10 unit machines would do that, then you would get for £3,500 an equipment equivalent to that which has cost £15,000 under the old system. There is, therefore, a good margin for adding more machines, or in case the machines should come more expensive. They will occupy little floor space and require no power. Some electric light will be wanted, but this will not be a serious item. There will be the expense of photographic plates or films and chemicals, but it will be nothing like so much as for type metal.

As to the labour cost, there may not be much difference against operating a monotype or linotype, as a skilled operator will be needed, but the work will probably be done more quickly; in fact, as quickly as on the typewriting machine. A man will be wanted to develop the films, but he will be able to keep pace with several keyboard operators. Another man will be wanted for laying down the films according to the imposition required, and in a large shop a man for printing down on the metal and preparing the plate ready for the machine. In small shops one man could probably carry through all the operations, but in large newspapers and book offices the operations would naturally be subdivided. In any case the work would go much more quickly than type setting, and of course stereotyping would be saved on large editions.

So far I have assumed that offset plates would be prepared, but machine builders have yet to prove that they can get a speed equal to the stereo rotary. The films prepared by the photo-composing machine could, however, be used equally as well for making photogravure cylinders, and we know that with rotary gravure printing an equivalent speed to the stereo rotary can be got. It may even be more convenient for a time to use the film negatives for making etched plates or blocks, sterotyping them for the news rotary, as was done with typescript by several provincial newspapers during the recent strike. There will be no difficulty about doing that, and it would be a convenience, though not much gain. The fact that these photo-composing machines might be operated by women is not to be overlooked. The work would be no more difficult than typewriting.

Probably photo-composing is likely to be more useful for newspaper and periodical work than for job printing. Think what it would mean for a newspaper having from 40 to 50 linotype machines with all their attendant equipment, to say nothing of the stereo plant, and the costly and elaborate printing machines necessitated by the system employed. If the type-setting and stereotyping can be dispensed with, the whole mechanical system for turning out a newspaper becomes vastly simplified and cheapened.

Of course, where illustrations are required there will be additional photo-process plant, but it will not cost so much as the equipment for block-making, because the equipment for routing, bevelling, sawing and planing the blocks will not be wanted.

As regards cost of printing machinery, there may not be very much difference between machines of equivalent size, whether for letterpress, offset or photogravure so long as sheet-fed machines are used, but for an all-rotary perfecting machine for newspaper work the photogravure machine will cost much less than the stereo rotary.

Whichever way we look at it, I feel sure the change from typographic to photo-process methods will mean cheaper plant, cheaper production, less labour cost, and reduced overhead charges.

You may ask why it would not be possible to utilise the photographic negative for making blocks instead of printing plates for offset or cylinders for rotary gravure? The answer is that though this course is quite possible, it is not economical. When negatives are printed direct on to zinc offset plates the process work is ended, and the plate is ready for the printer, and in the same way when work is put on the copper cylinder for gravure there is much less for the process man to do than in making blocks. When blocks are to be made, the image put down on the metal plate has to be etched, fine etched, routed, bevelled, proofed and mounted. When the printer gets the blocks he has to fit them into the formes, possibly has to underlay them, and certainly has to spend a good deal of time making ready. There is no make-ready in either offset or gravure printing. Half an hour, or an hour at most, may be spent

perhaps in getting things in working order for the run, adjusting impression, flow of ink, and damping mechanism in case of an offset machine, and in the case of gravure there is a similar tuning up to be done, but it is a small matter compared with the time spent in making ready a forme, especially a large forme of blocks.

The printer with a purely letterpress plant may say that the advantage gained is not sufficient to justify him in going in for offset or rotary gravure. It would mean installing a new plant and a new department of the business. But the economy does not end there. It is to be found also in the ease with which large sheets with a number of repeats can be laid down very cheaply, whereas to do the same thing by letterpress would mean having stereos or electros, which would be much more costly. This expense would be greatly increased if a colour job has to be worked. In the case of a small label, in two, three or more colours, letterpress would be quite out of it in price, for it could be put down on the plate by the step and repeat process at far less cost than by using blocks, and the number of repeats that could be printed on a sheet by offset would reduce the cost of machining enormously on a long run.

The lithographer may ask whether it would not be possible to achieve a similar result by transferring. He could not possibly do so against an efficient photo printing process. The mechanical devices which are now being so largely used in America for repeating subjects in the printing-down frame enable the work to be done very rapidly and correctly, especially for colour work. The second and subsequent colours can be laid down in absolute register with the first.

I am afraid there is some misconception as to the step and repeat method. It does not simply consist in making a stepped-up negative, as that is limited in size. There must be a further stepping in the printing-down frame to make up large plates, such as 30 x 40 ins., or 40 x 60 ins. The Americans seem to prefer to do all the stepping in the printing-down frame from one negative image, and I am inclined to think that is right. If it is desired to speed this up it is quite possible to make two or four exposures on one plate in the ordinary process camera, without resorting to an elaborate and costly apparatus. There are something like half-a-dozen devices being offered in America for stepping, whilst printing-down, and the latest known as the Bassist, is an extremely simple one, applied to what is practically an ordinary face-up printing frame. It is with such devices that the greatest development may be expected.

So far I have had in mind the preparation of plates bearing designs and illustrations from line or half-tone negatives. We have to consider also the printing-down of text matter. So long as type has to be set for it the procedure is usually that of pulling a good proof as copy for the process operator, who makes a line negative for printing-down. It is here where failure very often comes in. The letterpress printer does not seem to be able to pull a good proof unless he can make it ready on the platen press or cylinder machine. He has not achieved the skill of the photo-engraver's proofer, and too often he produces a proof which is squashed, the ink being spread and the impression too heavy. This is bad for the photographer. The lithographer is usually unable to pull a good letterpress proof, and thus the two branches of the printing craft do not help each other.

The Germans have got a process of printing the text matter on to a celluloid material, not the ordinary celluloid, but a special cellulose product which is very flat and flexible. A good sharp print is got on this and is dusted with bronze powder to make it more opaque. This celluloid print takes the place of the photographic negative for printing-down. Of course, it gives a white line print, but this is easily converted into a black line by a simple reversing process.

Photogravure workers adopt a similar plan by printing on translucent paper, and the Vandyck method used for the printing of maps and plans in the Government Offices is similar in principle to the method I have just described, the actual drawing being printed through instead of making a negative. Where work is already on stone or in type it is quite simple to take a transparent pull and use it instead of a negative, so long as the image is required same size.

A good deal of interest has been created by the Manul process. This is a method by which a negative can be produced from the pages of an ordinary bound book without using a camera and without damaging it in any way. The method consists in laying a specially sensitised plate on the page and allowing the electric light to shine on it. The rays go through the plate and are reflected back by the white paper, but not by the black ink. Thus the gelatine on the plate is hardened in the parts corresponding to the white paper whilst the rest corresponding to the print can be washed away. The film is afterwards dyed and stripped from the glass and a sheet of 64 pages can be easily printed from the films at one exposure. This is much cheaper than photography and requires less plant, but it is limited in its application to same size *fac-simile* work. A good deal of reprint book work is being done by this process.

Summarising the advantages of offset against letterpress, we may say :—

(1) That the cost of making the printing surface is cheaper than blocks and type formes.

(2) There is no make-ready.

(3) The printing speed is higher than on flat-bed letterpress machines.

(4) By using two-colour rotary offset presses either two colours can be printed at once or two sides of the sheet in one colour.

(5) It is unnecessary to use expensive coated paper.

(6) The consumption of ink is less.

(7) The power absorbed by a rotary machine is less than for a flat-bed letterpress machine.

(8) The capital tied up in keeping type formes standing is vastly greater than for keeping negatives and zinc plates. (A zinc plate for printing a 60 x 40 in. sheet costs from 20s. to 26s.)

(9) For colour work high lights can be printed without any grain or screen over the whites and with softly vignetted edges such as it is very difficult to get with block work, except by elaborate make-ready.

(10) Half-tones can now be printed on the offset press with quite pleasing results, and customers are preferring the soft effects to the hardness of half-tone block work on coated papers.

(11) The photo-process of the work is simpler and cheaper than making blocks.

It may be urged that for colour work there is no real substitute for fine etching, by which the most perfect results in block work are produced. This is being remedied by retouching on the negative and in developing the image on the plate. Processes are also being employed which claim to do without retouching, and very fine results are attained. Hitherto a good many of the failures of offset work have been due to the operators working half-tone and colour negatives in the same way as for blocks, whereas a quite different negative is required for photo-offset.

Grain-processes are now coming largely into vogue for photo-offset because such work can be rendered much better by it than by blocks.

Perhaps it may be urged that an offset plate would not wear through a long run so well as copper half-tone blocks. There is no very definite evidence on this point, but I may point out that it is easy to make a duplicate plate once you have the negatives.

So much for offset. Now let me refer to the bearing of rotary photogravure on the work of the letterpress printer.

As to the quality of the results of photogravure compared with either block work or offset, there can be no difference of opinion so far as single-colour work is concerned. Just consider the wonderful richness of the tones, the photographic fidelity of the result, and the absence of screen effects.

Undoubtedly the public like this kind of printing, and they buy freely the publications printed by its means. They recognise and appreciate this kind of printing as a relief and change from the monotony of half-tone.

As with offset, it is possible to print on almost any kind of paper. Even on the commonest newspaper the results are far away better than half-tone. But, of course, the more suitable the paper the better the result, and photogravure needs to be printed on good paper to show at its best.

The consumption of ink is very low—something like 1 to 1½ lbs. per 1,000 copies on a large news or periodical sheet.

The speed of printing is much greater than either offset or letterpress printing when rotary machines are used. For high-class work 4,000 to 5,000 perfected copies per hour are easily obtained, but for cheap newspaper work speeds of 24,000 to 32,000 copies per hour have been achieved in the *Cape Times* office.

There is no make-ready with rotary photogravure, and no special attention to secure uniformly good work throughout an edition is needed.

Thus the advantages are all in favour of photogravure for book, newspaper and periodical printing, but it does not compete with offset for commercial work, nor at present does it compete with either blocks or offset for colour printing. Its application to colour work is still in the experimental stage, but some very fine results have been obtained, and they give promise of greater achievements in the future.

One of the questions which arises in connection with gravure is the cost of cylinders compared with blocks or offset plates, though it is hardly a matter for comparison because the cylinders are used

with the special object of securing a certain result which cannot be obtained by either of the other processes.

Still, some comparison can be made without disadvantage to gravure. For plain, straightforward work, without elaborate lay-out and borders, the cost of a cylinder filled with pictures will be much less than the same area of blocks. It is not easy to figure the cost of gravure work on a square inch basis because the engraving and printing must be taken together.

I believe one house which works for the trade figures out the cost of engraving cylinders at 10d. per square inch of surface, but it can be done much cheaper by firms making their own cylinders. If there were 16 8 x 5 in. pages on the cylinder their cost would amount to £26 13s. First-class squared-up half-tones for the same size would come to £32 on the basic rate of 1s. per sq. inch. If, however, there were text and pictures to be reproduced the cost would be much more, as both line and half-tone blocks would have to be made and joined up.

Probably the cost of making an offset plate will be in every case less than making a cylinder, but no offset plate can ever produce the results of the best photogravure work. Soon, I think, it will be possible to print gravure from thin copper plates bent round a cylinder. Then, I think, gravure will compare very well with offset, and printers will be able to get these plates made outside as readily as they now get blocks or offset plates.

As to the possibilities of colour printing by the gravure method, progress is being made, and the results are most promising, but many difficulties have yet to be overcome. It is not possible to do anything on gravure cylinders equivalent to fine etching; therefore all the effects must be obtained in the negatives. This means a great deal of retouching unless some improved process of colour selection can be found.

Some very artistic results have been obtained in this country and in Germany and Holland on flat-bed machines and sheet-feed rotary machines. Colour work on all rotary gravure machines presents much more difficulty. Nevertheless, some excellent results have been got by a German house on a machine which prints all the colours simultaneously on a machine similar to that used for coloured wall-paper printing.

In America, the *Chicago Tribune* has for some months past been producing regularly a Sunday supplement in colours by gravure printing. I believe that the system employed is to produce first one cylinder as the key, and from this re-transfer to other cylinders, which are worked on by etchers accustomed to pricking out colours, who remove or add work as required. Each colour cylinder is put into a separate printing unit and the paper passes from one to the other. The Prismatone process which is being exploited in America is, I believe, a similar method for producing the colour cylinders.

The purely photographic method of colour separation presents difficulties for gravure, just as it does for offset, and much retouching must be done at present to get a passable result.

There remains much to be done to achieve prefect results in colour printing by gravure, but if it can be accomplished so as to make it a commercial process it will be a powerful competition to all other forms of printing.

W. Gamble.

THE MODERN CHEMISTRY OF GELATINE.

(In a recent communication from the Eastman Research Laboratory Dr. S. E. Sheppard reviews some of the most recent work which has been done in the complex problems which concern the part played by the gelatine in the making and use of gelatine dry-plate emulsions. These include the effect of imporities in the gelatine which reduce sensitiveness; viscosity and setting point of gelatine solutions; mechanical strength of jellies and their capacity for swelling; and the behaviour of gelatine in hardening fixing baths and on drying. The paper is being published in the United States in the "Journal of Industrial Engineering Chemistry.")

(*Continued from page 679.*)

Photographically, the viscosity of gelatine solutions and of silver halide emulsions is of great importance, since not only does it affect the formation of the emulsion, but also controls the operation of coating or spreading.

The average concentration of gelatine in emulsions is from 6 to 7 per cent., while the sequence of operations in emulsion making, particularly digestion in slightly acid solution at elevated temperatures may alter part of the gelatine; this is usually only a fraction of the total used. Hence, the viscosity of the given gelatine determines the viscosity of the emulsion, and thereby the coating speed. It is further interesting to note that the coating temperature is usually around 35 deg. to 40 deg. C.; that is, the region of the putative transition point.

(3) *Influence of Sensitiveness of Light.*

The early conception that the value of gelatine in photographic emulsions consisted in its functioning as a photo-chemical sensitiser, by absorption of halogen, has been largely abandoned. The most that can be definitely stated at present is that certain impurities must be reduced to a minimum.[11] In regard to the chemical analysis, we may note that the ash should not much exceed 1 per cent., that copper, lead and iron should be negligible, and chlorides low. On the organic side, organic sulphur, giving silver sulphide, should be absent, almost reducing substances (reducing ammoniacal silver nitrate in the dark within twelve hours) as well as greasy substances and mucins.[12]

Functions of Gelatine in Negative and Positive Making.

When we pass from the preparation and exposure to light of gelatino-silver halide emulsions to the operations leading to finished negatives and positives, it is the properties of the hydrogel which are of chief importance. First of these is the *jelly strength*, since, like the "wet strength" of paper, this determines the endurance in many stages of manipulation. Most tests for this, following the time honoured "finger test" for glues, have involved determination of the force required to press a plunger a definite depth into the jelly.[13] These methods are satisfactory for most industrial purposes. There is some possibility of error by "skin formation" at the surface, however, and no definite elastic constant is measured, since both compression and shear are effected in unknown proportions. For these reasons I have designed a torsion dynamometer exerting pure shearing stress on jelly cylinders. This instrument and its operation has already been fully described[14] so that it will suffice to state that "jelly strength" may be measured therewith, either by the *modulus* of *rigidity*,

$$N = \frac{\text{stress}}{\text{strain}}$$

or by the *torsional resilience* = ½ (stress x strain) at limit. Experiments with this have shown that gelatine jellies are rigid, and follow Hooke's law practically up to the breaking point. After moulding a jelly and keeping at 0 deg.—5 deg. C., the rigidity increases rapidly at first, and becomes constant in about ten to fifteen hours. Between 0 deg. and 10 deg. C., it does not vary much with temperature, but above 10 deg. rapidly falls, to become zero at the "melting point." The relation of the rigidity to concentration does not follow an identical curve with different commercial gelatines; but it is approximately represented by the equation

$$N = k\, c^n$$

where n approaches 2, but varies with different gelatines. On varying the hydrogen ion concentration of ash-free gelatine jellies I find for concentrations from 4 to 10 per cent. of ash-free gelatine a maximum rigidity (jelly strength) at about $p_H = 8$, above which the rigidity falls off rapidly. The decline from the maximum

11. cf. B. V. Storr. *Annual Reports of Society of Chemical Industry on Progress of Applied Chemistry, No. 2, 37*, p. 405 (1918).
12. Congeners of gelatine, *in chondrin*, and giving slimy precipitates.

13. A bibliography of these methods is given in a forthcoming monograph by the writer, on "Gelatine and Its Uses in Photography."
14. "J. Ind. Eng. Chem.," *12*, 2,007 (1920).
"J. Am. Chem. Soc.," *43*, 539 (1921).

toward lower p_H values is less steep, a flat portion or "shoulder" existing near the iso-electric point, but no maximum or minimum Below $p_H = 3$ there is again a rapid fall. Certain anomalies with commercial gelatine have been traced to the influence of inorganic ash constituents; thus aluminium, at .01 per cent. Al_2O_3 on dry gelatine greatly alters the curve, a secondary maximum being produced at $p_H=4$.

The Swelling of Gelatine and Photographic Operations.

In the operations of development, fixation, washing, after-operations, as reduction, etc., the most important property is the swelling of gelatine in water and aqueous solutions. It is this property

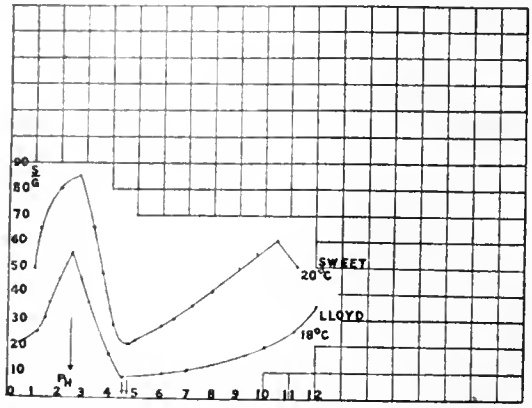


Fig. 4.—Swelling of gelatine in caustic soda and hydrochloric acid, S G=gms. water per 1 gm. gelatine.

which makes the gelatino-bromide, "dry" plate or film so amenable to the variety of operations used in photography.

Although much current theory is based on the idea that gelatine in swelling does so uniformly in all directions, this is not quite exact. In practice, previous conditions of drying largely determine the subsequent swelling. In the photographic emulsion the

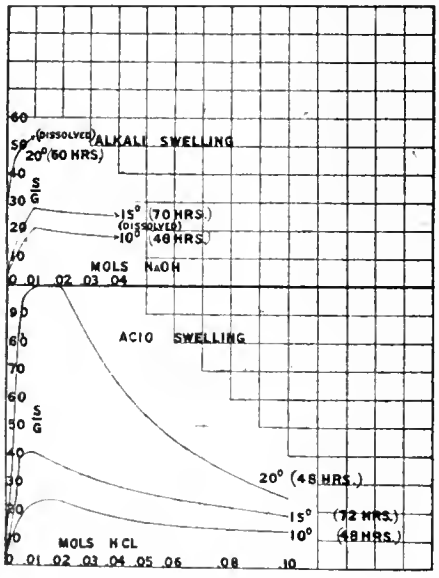


Fig. 5.—Influence of temperature on swelling limit.

adhesion to a rigid support (relatively) prevents swelling effectively taking place in any direction save that normal to the surface. Since swelling forces perpendicular thereto do exist, and come into play when the swelling is considerable, the support is substrated with hardened gelatine before being coated with emulsion. It has been known for some time that the swelling of gelatine depended decisively upon the acidity (or alkalinity) of the solution in contact. This has been developed by H. R. Procter, and Procter and J. A. Wilson, in terms of Donnans theory of membrane equilibrium, to explain the swelling quantitatively, at least on the acid side of the iso-electric point. This theory has been discussed very fully elsewhere[15], and it is not necessary to enter into details. Briefly, it is assumed that gelatine forms a readily ionizable salt with the acid; to secure membrane equilibrium the concentration of diffusible ions in the jelly phase is greater than that of the external solution. The tendency of the (diffusable) negative ions to diffuse outward is restrained by the cohesion

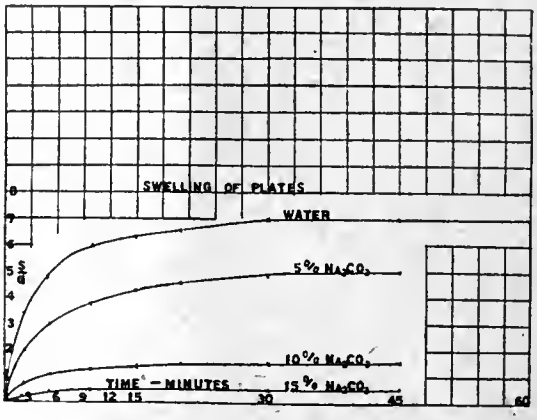


Fig. 6.—Rate of swelling of gelatino-silver-bromide emulsion in sodium carbonate solutions.

of the jelly, and the swelling (increase in volume) produced is proportional to the excess concentration of diffusible ion. The agreement of the calculated values with experimental ones is very satisfactory; J. Loeb has shown further that if swelling in acids of different concentrations is plotted against the p_H of the solu-

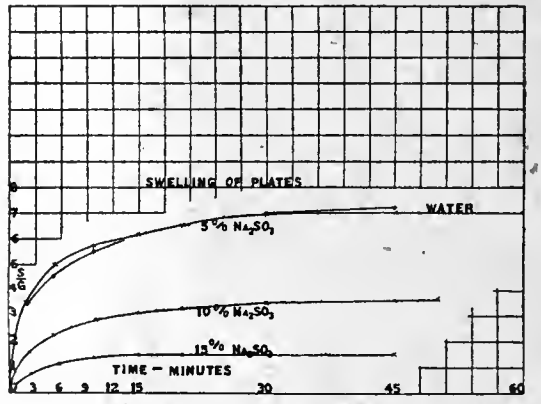


Fig. 7.—Rate of swelling of gelatino-silver-bromide emulsion in sodium sulphite solutions.

tion that all (effective) monobasic acids give nearly identical curves, sulphuric acid, as a dibasic acid giving somewhat lower values. Swelling on the alkaline side also passes through a maximum at a certain p_H. The general form of the swelling curve is illustrated in Fig. 4, and the rapid increase in swelling with rise of

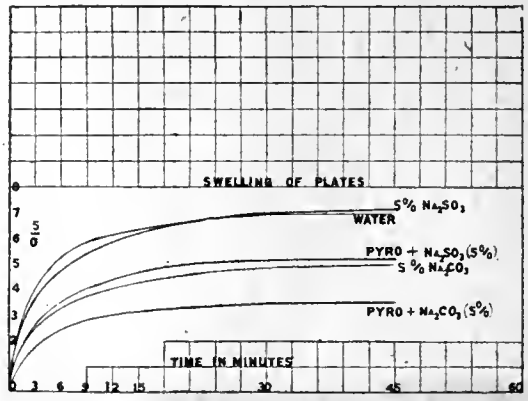


Fig. 8.—Rate of swelling of gelatino-silver-bromide emulsion.

temperature is shown in Fig. 5, in this diagram the abscissæ are molar concentrations of acid and alkali instead of p_H.

In considering the relation of such curves to the photographic

15. H. R. Procter and J. A. Wilson, J. Amer. Leather Chem. Assn., 11, 399 (1916).

process, it must be remembered that the plate or film is first placed in an ordinary alkaline developing solution, in which it remains, if *time* development is used, perhaps 5 minutes. If

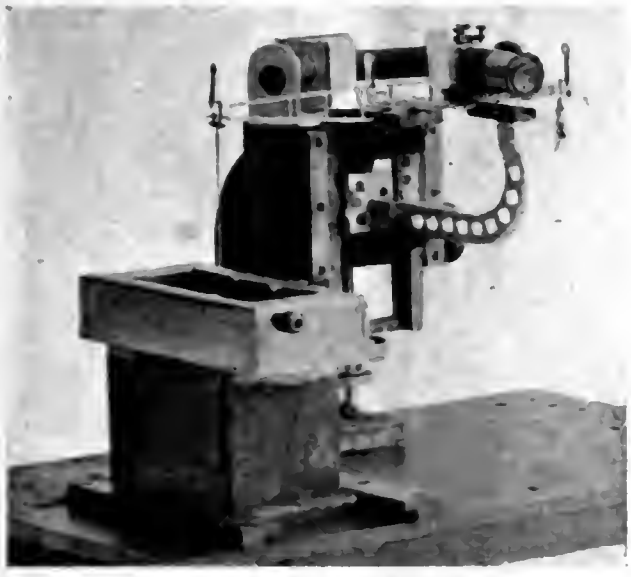


Fig. 9.—Auxometer for measuring thickness of gelatine film

stand development is used, it remains a longer time, say 15 to 25 minutes, in a much less concentrated developing bath. It is then rinsed in water and transferred, usually, to an acid fixing bath. The acidity of this is not very high (ph 4-5, see later), but in any case the gelatine has to pass back through the isoelectric point of minimum swelling. Before considering what effect such variations may produce, it will be well to note the order of magnitude of normal swelling with photographic films, and its change with time. Since under normal conditions the gelatine can only swell perpendicularly to the plane of the plate or film, the swelling can be measured either by weighing or by measuring the thickness. In fig. 6 is shown the rate of swelling of a photographic emulsion as followed by *weight* measurements.

In this case sodium carbonate solution was used, this being a generally used alkaline component of developers. In figs. 7 and 8 are illustrated the course of swelling of an emulsion in sodium sulphite solutions, and in a pyrogallic acid developer with sodium sulphite.

All these determinations were made by the weighing method. This procedure is time-consuming, and not applicable where it is desired to follow the progress of swelling simultaneously with an actual photographic operation—e.g., development. To accomplish this the writer has designed an instrument to measure the thickness at any stage. This instrument, which may be termed an *auxometer*, is illustrated in fig. 9. It consists of a micrometer carrying a delicate balance beam; at one end is a silica rod, with a small "foot," just in contact with the film surface; at the other a counterpoise. Any increase in thickness (swelling) throws this off balance, the deflection being optically magnified. Balance is restored by the micrometer screw, and the change in thickness read.

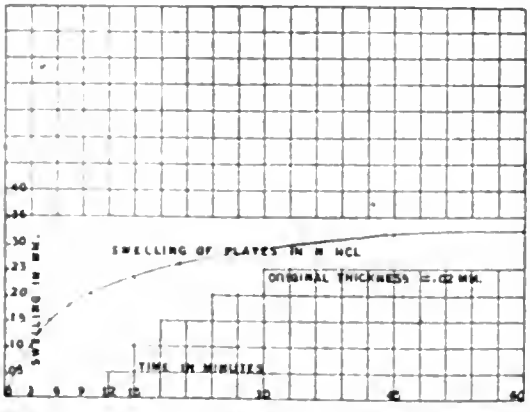


Fig. 10. Swelling of gelatino-silver-bromide emulsion in hydrochloric acid.

In fig. 10 is shown the swelling of a film in an acid solution.

S. E. Sheppard.

(*To be continued.*)

WHAT THE PUBLIC LIKES.

The late Lord Northcliffe's recipe for successful journalism is stated to have been: "Give the public what it likes, not what you think it ought to like." In one sense, this is genuine wisdom. In great fundamental matters the instinct of the multitude is usually right, rather than that of the individual.

In another sense, however, this formula has often been twisted into a wrong direction—that of judging popular taste by its more obvious faults and fallacies, as if these were common to all, rather than peculiar to a few. Photographers, in especial, have long been used to quoting this saying, as an excuse for mediocre work and a low artistic ideal. That is a bad mistake, and by no means a modern one. Back in the mists of antiquity, Cicero (*De Oratore*, Book III.) finds it necessary to warn his readers that, while the learned and illiterate may differ greatly in other things, they show surprisingly little difference in their judgment on points of artistic taste. In other words, "playing to the gallery" is a tactical blunder, even when the boxes and stalls are empty.

How, indeed, can the photographer actually be sure of what his public wants? His clients are not good at expressing their artistic likes and dislikes; their non-technical language often conveys quite a wrong impression of their true meaning. What they seem to object to in a portrait very frequently turns out not to be the real cause of complaint. Hence, in attempting to summarise and satisfy our public's requirements, in antagonism to our own prepossessions, we may merely follow strange paths that lead nowhere.

The fallacy of trying to propitiate the public by ruthlessly displeasing ourselves is beginning to be exploded. The remark of a salesman at one of New York's leading stores, after the exit of a particularly good purchaser, is piquantly relevant. "Any old fool," said he, "can sell a person what he fancies he wants; but the really clever man can load him up with a year's supply of what used to be his pet aversion! That customer is going to deal here again. If I had sold him to-day, what he thought he wanted, he would have consigned me to Hades to-morrow!"

It must always be remembered that a basically good principle can be worked with practical permanency, whereas a false one breaks down sooner or later—often with tragic suddenness. As the political axiom goes, "You can't fool all the people all the time." Unquestionably, it is trying to do so, to keep on giving an artistically-ignorant clientele work which we do not ourselves approve of, while making them believe that both we and they are satisfied.

The shapers of fashion are wiser. They do not trouble about the hypothetical likings of an imaginary public. They design to suit their own tastes, after more or less sound artistic canons, and say calmly: "This, and no other, is what will be worn." The tailor and the modiste supply things rigidly in accordance with this dictation, and the public unmurmuringly accepts.

Photographers, unfortunately, have no such uniform ideal. The majority, perhaps, may not unfairly be described as suspicious of the definitely artistic, and obsessed by the notion that most people prefer what may be called the picture-postcard and illustrated-newspaper style of portraiture, though mounted in a more select way and duly raised in price. That idea is no longer tenable, whatever it may have been in the past. Any attentive observer may satisfy himself that the studios which have been squeezed out through the prevailing difficult conditions are practically always those producing commonplace work.

In the principal thoroughfare of a certain London suburb, for instance, there were till recently three different studios. The output of one was cheap and of poor quality. The second, an old-established firm, gave "the usual thing"—that is, "hard and bright," somewhat over-retouched, a little stiff and formal in pose, mainly of a black tone, and very neatly mounted on "superior looking" mounts. The third studio made a distinct artistic appeal. The tonality of the pictures was soft, strength and vigour being secured simply by striking systems of lighting. Each portrait was characteristic. The prints varied in colour from sepia to a brown-black, the mounts were folders of subdued tint, in various unconventional types. The windows were handsomely panelled in oak, and the set-out altogether unlike the ordinary photographer's display. The prices, too, were slightly higher, though still reasonable considering the quality. Now, nine photographers out of ten would probably have felt certain that the older studio, with its compromise in ideals, would outlast the others. What actually happened is that the cheap firm went bankrupt first, next the old-established one closed its doors. The sole survivor, more prosperous than ever, is the firm that does *not* try to give people what they like, but makes them like what they are given.

Again, what is happening to the old type of ugly, staringly ornate furniture, which was supposed to be the only kind that would sell? It chokes up the various warehouses, and will doubtless end its days in seaside lodgings. Beautiful furniture, the quaint, the uncommon, that based on lasting principles, is selling now. The so-called stupid British public instinctively *knows*. For all its outward Philistinism, it is not nearly so obtuse and blatant as we are asked to believe.

A. Lockett.

COMMONSENSE RETOUCHING.

[A writer in the November issue of "American Photography" has some useful advice to give to the retoucher who is taking up the work for the first time. As he remarks, experience is most necessary, and it should be best for the beginner to practise his strokes upon some old and useless negative before attempting the true work. The previous pencil retouching on this negative should be cleaned off by the aid of a piece of cotton wool moistened with pure turpentine, and the negative thoroughly dried. It may then be re-coated with medium and the practice strokes attempted. A print should preferably be taken before retouching, and another from time to time as the work of retouching progresses. By this means the tyro will gain considerable knowledge as to the extent to which retouching should be carried, and he will be able to lessen or increase the quantity of his work to suit the particular portrait in hand. It should be borne in mind, however, that retouching is merely an aid in the obtaining of a good portrait, and should not be made use of to correct errors which have occurred in the studio. With the present-day possibilities of lighting which the operator has available, shadows and high-lights may be perfectly controlled, and the retoucher should only be called upon to soften lines in the resulting negative, or to make pleasant any awkward form or arrangement, which is beyond the studio operator's control.]

Retouching is an art that is comparatively easy of accomplishment. Not how to apply the lead, but where to apply it is the essential thing to know, and, for that reason, all teaching can be only general in scope. The ideal retouching pencil must contain a uniform, high-grade lead of constant quality. It should be obtainable in many degrees of hardness, at a moderate price and in convenient, non-fatiguing holders. To begin with, about four pencils will be all that are needed—hard, medium hard, medium soft and soft. Other leads, probably, will accumulate as time goes on and experience ripens, the best grade to use in any particular instance can only be ascertained by experience. Information that will be neither confusing nor liable to misuse is that the lead which blends with the surrounding parts of the negative is the one to be selected, and the heavier the deposit on the negative the softer will be the lead required to match it in density. An etching knife is a necessary part of the retoucher's equipment. This may be a shaped and sharpened darning needle, an etching pen, used with an ordinary pen-holder as a handle, or a well-sharpened penknife. A knife is very useful for removing unnecessary high-lights, such as, for instance, lights reflected by buttons, jewellery or eyeglasses. For reducing larger areas one of the many forms of abrading implements, such as the "hi-lite" reducer, made of fine strands of spun glass, is better than a knife and is easier to manipulate. The art of using a knife is harder to master than the use of the pencil, yet it is an accomplishment that should be learned, as it is of inestimable value, and considerable practice is needed before the user becomes really expert. The knife should be held so that only the surface of the negative is touched and the emulsion should be shaved very lightly. The knife must not scrape or drag, or the work will be uneven, a little careful practice on an old negative being necessary to get the required action. India ink and spotting colours are needed to fill in pinholes and deep scratches, and these are usually applied to the negative with a fine "spotting" brush. If a pen point is used as the means of application, great care must be taken to avoid damaging the fragile emulsion beyond repair. "Opaque" is very useful for "blocking out" objectionable backgrounds. Often a subject will stand out with a new value and be much more convincing if the print is made with a complete absence of background. This effect is easily secured by "opaquing" the negative up to the outer edge of the subject, the resulting print showing the subject against a clear white background. This is usually necessary in commercial work, with machinery, and other subjects where clear detail is required. It needs considerable patience and a steady hand. Sometimes the opposite effect is desired; a black background instead of a white one. This effect can be obtained by etching away the background. Some kind of retouching medium is needed, which is to be rubbed on to the negative, where it dries quickly, leaving a fine hard surface that is ideal for the easy application of the retouching lead. This medium at the same time protects the emulsion from abrasion and from the attacks of insects.

To secure sufficient transmitted light it is necessary to support the negative in some manner close to a window. Daylight, however, is not altogether satisfactory, because it is constantly varying. The problem of proper illumination is best solved by using a retouching stand lighted by an electric bulb, the direct rays of which are softened and diffused by a piece of ground glass interposed between the negative and the light. The ground glass should not be very close to the negative, or, if it is, it should be placed smooth side up, otherwise the grain may be too plainly visible and may interfere with the pencil work. If daylight is utilised as the means of lighting the negative, a north light should, if possible, be used, as it is far less variable than any other. The mirror supplied on the commercial retouching stands is not nearly as good a reflector as a large square of white cardboard. There are many so-called "strokes" and "touches," each retoucher having his or her favourite. Four of the most common strokes are illustrated, each being, necessarily, much exaggerated.

Stipple. Crosshatch. Figure eight. Blending.

One of the first questions asked by the novice is: "What stroke shall I use?" and this is a hard question to answer. The average retoucher uses many "strokes," and variations and combinations of them, the best being the one that covers the area most quickly and with the smoothest effect. Every worker will have his own idea as to the amount of work a negative requires, but, as a general rule, much of the ordinary commercial work is over-retouched. It is very seldom that a patron desires a portrait so much smoothed out that there is no difference between the face and the neck, or "cleaned up" to such an extent that there are no separate tones in the numberless light-planes of the face, head and cheeks. The usual portrait can be divided, broadly, into four "zones," each being sub-divided into further zones. The chief divisions are the

face, the bust, the hands and draperies The forehead is a surface that is made up of a number of light-planes. Wrinkles may be removed entirely or merely softened. Dark circles under the eyes and the "crows' feet" at their corners should be eliminated. On the pupil of the eye there should, usually, be a triangular high-light. If this be round or bead-shaped, it will impart a lifeless stare and give the portrait an unnatural appearance. Eyebrows may be arched a little or may be softened, if they are too dark, by the careful application of the pencil. A crooked nose will be straightened, as if by magic, when the shadows at the side are lightened or evened up. Flat nostrils can be given a better appearance if a slight high-light along the ridge is introduced by careful pencil work. Hollow cheeks, or cheeks in which a healthy, red colour has come out too dark in the photograph, may be filled out by retouching, but here caution must be exercised, for if it is overdone a "heavy" look is imparted to the subject. Receding chins may be built up, by the simple expedient of lightening the upper part a little. A small shadow, just under the lower lip, produces the illusion of greater depth and roundness of the entire face. A shadow should always be visible between the neck and the jaw. Squaring up the latter and adding a high-light to the "point" will give the subject a forceful individuality. In portraits of ladies, if the neck appears "bony," the artificial aid of retouching may be called into service.

Many instructions have been given in connection with the manipulation of the subject's hands. Beautifully posed hands are rare. They are hard to manage, and to make them appear graceful and at the same time natural is one of the problems of portraiture. If the veins are over-emphasised, retouching will help. Sometimes it is necessary to reduce them a little in size by the careful use of the etching knife.

Draperies that are light in colour may need a little local reduction. Any of the specially-prepared reducing pastes, or a piece of cotton wool, moistened with alcohol, used as an eraser, will much improve the print. Sometimes the use of the knife is necessary to improve outlines. As a general and very broad rule, it may be stated that in portraits of ladies under thirty all lines and wrinkles may be removed. Over this age, the objectionable "footprints of time" may be eliminated and other character lines softened as much as may be considered necessary. Portraits of men usually require very little actual retouching, only a general "cleaning up" and softening of too aggressive shadows. The best advice anyone can offer to the tyro is, use sane judgment, practise constantly, and study all the time.

It must not be forgotten that much of the retouching, once thought to be imperative, may be eliminated by skilful and intelligent lighting, by careful focussing and by the use of a suitable lens.

J. De Witt Kalfs.

FORTHCOMING EXHIBITIONS.

December 9 to 31.—Rochdale Amateur Photographic Society. Particulars from the Hon. Secretary, W. Lord, 10, Derwent Street, Rochdale.

1923.

February 5 to March 3.—Northern Photographic Exhibition, City Art Gallery, Manchester. Latest date for entries, January 12. Particulars from the Hon. Exhibition Secretary, Walter Johnson, 30, Hartington Road, Chorlton-cum-Hardy, Manchester.

March 1 to 8.—Birmingham Photographic Society. Latest date for entries, February 15. Particulars from the Hon. Secretary, J. E. Breeze, 178, Broad Street, Birmingham.

March 2 to 31.—Pittsburgh Salon of Photography. Latest date, February 5. Secretary, Charles K. Archer, 1,412, Carnegie Building, Pittsburgh, Pa., U.S.A.

March 13 to 16.—Exeter and West of England Photographic Exhibition. Particulars from the Hon. Secretary, Frederic G. Tutton, 9, Union Road, Pennsylvania, Exeter.

March 15 to 24.—Photographic Fair, Holland Park Hall. Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1.

Owners of Photographs Wanted.—It was stated in last week's newspapers that over 100 photographs—mostly of soldiers killed in the war—are in the possession of the police at Hendon awaiting identification. They were discovered at a house in Carlton-vale, Kilburn, occupied by a man who was remanded at Hendon on a charge of obtaining money by false pretences.

Patent News.

Process patents—applications and specifications—are treated in "Photo Mechanical Notes."

Applications, October 30 to November 4 :—

Dark Slides.—No. 29,630. Photographic dark slides. P. C. Bull and K. C. D. Hickman.

Reflex Cameras.—No. 29,970. Photographic reflex cameras. A. J. Denniss, W. Dockree, and Houghton-Butcher Manufacturing Co., Ltd.

Cinematography.—No. 29,766. Liquid treatment of cinematograph films. J. M. Andrews, J. A. Ball, Technicolor Motion Picture Corporation and L. T. Troland.

Cinematography.—No. 29,840. Cinematographic film. A. L. V. C. Debrie.

Cinematography.—No. 29,976. Apparatus for coating cinematographic, etc., films. E. Robertson and L. M. Wyllie.

Colour Cinematography.—No. 29,764. Colour cinematograph films. Technicolor Motion Picture Corporation.

Colour Cinematography.—No. 29,629. Manufacture of multi-colour screen films, or plates for colour cinematography. J. Camiller and A. Hay.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country, or abroad, in the case of patents granted under the International Convention.

Camera for While-you-wait Postcards.—No. 166524 (July 13, 1920). The invention relates to a photographic camera having provision for developing and copying negatives, in which the image is focussed, and the developing, fixing, etc., of negatives and positives can be carried out inside a portion of the apparatus which constitutes a dark box. The camera is provided with a sliding bellows frame having a negative holder attached, enabling positives to be produced by means of a lens from negatives previously obtained in the same apparatus. In this camera a carrier frame for negatives or positives, and a focussing screen holder, are permanently and interchangeably mounted inside a box extending from the rear of the camera in such a manner that the focussing screen can be placed in position behind the objective without removing the carrier frame from its point of attachment and *vice versa*. This arrangement of the focussing screen and carrier frame in the interior of the dark box makes it possible to work with precision inside the box rapidly and unhindered.

The dark box is provided inside with receptacles for containing a supply of photographic cards or papers, capable of being opened and closed inside the box. The end of the wire which actuates the lens shutter is passed into the interior of the box. These fittings enable a continuous, and consequently rapid, mode of working in the interior of the box, commencing with the insertion of the sensitised paper or card, until the printing has been finished. A sliding copying arrangement is provided for producing positives from negatives; the carrier frame for the negatives can be swung up or folded down, and is only set up when required. In the accompanying drawings the sliding frame C of the apparatus has mounted upon it an objective carrier D, capable of being displaced and fixed. In the objective carrier a frame D^1 with an objective E (preferably of high rapidity and short focal length, and having a time and instantaneous shutter F attached) is mounted so as to slide up and down.

The objective frame D^1 is connected by a bellows B to the box A. The box consists of a base A^1 of the wall K for receiving the movable carrier frame K^1 and the focussing screen holder J, the two side walls L, the upwardly opening door T and the lid R, which contains a ruby-red transparent plate R^1. The sleeves M are attached by rubber bands or springs to the arms of the operator to prevent the entrance of light, and open into the side walls L. Troughs 1, 2, 3 are fitted in the base A^1, and may be slid in or suspended therein in a light-tight manner, preferably by being contained in a common trough O, which is suspended in the base. Spectacle glasses 9 of ruby glass are

fitted in the door T. From the shutter U an antinuous release V with a press button W passes into the interior of the box. In the wall K the carrier frame K^1 and the focussing screen J are mounted and are interchangeable. The carrier frame K^1 is mounted on the wall K so as to be capable of swinging laterally about the hinge 15 (fig. 2). The carrier frame K^1 consists of two parts K^{11} and K^{111} between which the sensitised paper is placed and clamped round its edges by fastening down the part K^{11} on the part K^1. The focussing screen J is mounted on the wall K, and is capable of swinging on the hinges 16. By this means either the focussing screen J or the frame K^1 can be brought behind the objective E, according to whether the objective is to be focussed on the subject or by inserting a sensitised card, a negative or positive is to be produced. Where there is space on the camera walls, receptacles 6, 7, for photographic papers or cards for negative or positive purposes are fitted.

In front of the objective frame D^1 on the slide C a copying extension part H is mounted. The copying frame F, which is

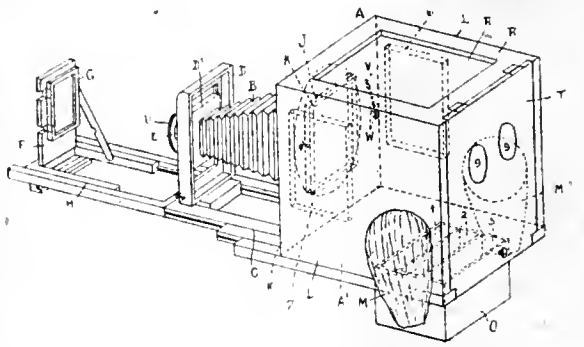


Fig. 1.

hinged and can be erected on it, carries the frame G for the reception of a negative. The negative is illuminated by reflected light either natural or artificial, and the objective E is focussed on this negative, which may be effected by simply pushing out the frame H. If a number of positives are to be made, they can be finished separately or they can be stored in the containers 6, 7, and subsequently developed one after another, and so on, so that the person ordering the photographs can take them away with him at once.

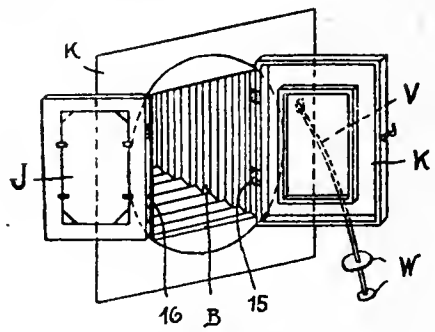


Fig. 2.

When an exposure is being made, the removable frame K^1 is swung open, the sensitive material placed in it, the focussing screen J swung away, and the frame K^1 swung to again, so that it takes the place of the focussing screen. In the interior of the camera A, by a pressure on the knob W of tho antinuous release V, the objective shutter U is opened and closed as required, for a time or instantaneous exposure. The exposed negative is removed from the frame K^1 by means of a clip, placed in the developing trough 1 and developed while being viewed through the spectacle glasses, the requisite illumination of the interior of the camera being obtained through the red window R^1, or a red lamp inside the camera. After the development is finished, the exposed plate is placed in the water trough 2, when it is passed, after being washed, to the fixing trough 3. For reproduction purposes, the copying extension H is pulled out, the copying frame F at the end of it is erected vertically, and the frame G on it opened.

The door T of the camera A is thereupon opened, and by means of a clip the negative, which has in the meantime been fixed, is taken out and can be mounted while still wet in the copying frame G, after which it is reproduced in the ordinary manner. The positive obtained by this means is removed from the frame K^1 and developed, washed, and fixed in the same manner as the negative.—Wilhelm Feuerzeug, 30, Brigittenauerlände, Vienna XX., Austria.

New Materials.

Christmas Greeting Mounts and Calendars. Made by Bartons', Finch Road, Handsworth, Birmingham.

Although we have long been familiar with the highly artistic mounts of Messrs. Bartons', and have admired an invariable good taste in the design of these requisites, we cannot remember having seen hitherto mounts of theirs intended for the transmission of Christmas greetings. A selection of these, which Messrs. Bartons' have sent to us, shows the same nice discrimination in the use of papers and boards of the most agreeable tints and textures. The mounts are of the folder pattern, and most of them for the attachment of prints by pasting down or by attachment at two corners. One or two, however, are of the slip-in pattern. While it would be invidious to name as specially pleasing any of these productions, we may signalise one or two. The "Valdena" is a folder, made in sepia or grey, for cabinet prints pasted down on a plain tint of suitable colour. The price is 3s. 3d. per dozen, or 36s. per gross. Another very choice little mount is the "Rothney," for prints measuring about $3\frac{3}{4}$ x $2\frac{1}{2}$ inches. It is made in brown or white and is priced at 1s. 9d. per dozen, or 18s. per gross. Another tasteful folder for postcard portraits is the "Baronic," obtainable in brown or grey at 2s. per dozen, or 20s. per gross. Messrs. Bartons' likewise are offering for the forthcoming season a number of equally attractive calendar mounts for prints ranging in size from V.P.K. to postcard, and in price from 4s. 6d. to 6s. 6d. per dozen, or 48s. to 72s. per gross. Here, again, choice is offered between the paste-down and slip-in patterns. The calendars are provided with silk tasselled cords, and may be had either upright or landscape in shape. Photographs mounted on any of the productions before us form most artistic and acceptable Christmas gifts.

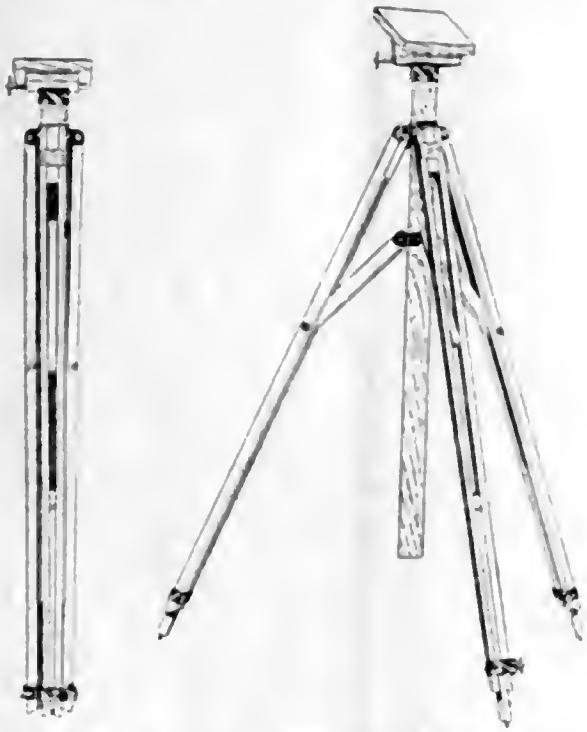
Sedar Guilleminot Bromide Paper.—This paper, which is manufactured by the Guilleminot Company, of Paris, combines a printing medium of undoubted excellence, with sufficient speed to allow of enlargements being made with a minimum of exposure. The paper is supplied in three surfaces—matt-smooth, semi-matt and glossy—and is coated upon either single or double weight base, no extra charge being made for the latter. The sample of the paper which has reached us is of the semi-matt variety, and we have made prints by both contact and enlargement with the idea of testing the general qualities of the printing medium. By contact, using a portrait negative of average density and a 50-c.p. lamp at 4 ft. distance, we obtained fully-exposed prints in ten seconds, which upon development gave perfect gradation and good density, the image being of fine black colour, full of life and sparkle. The semi-matt surface, which closely approximates to the surface of a carbon print, gives considerable luminosity to the shadows. In enlarging, we found the paper of good average speed. Upon development we obtained the same high quality of print, showing perfect high-light detail and fine luminous shadows. Using the borax-metol-hydroquinone developer, slightly warm-black tones were obtained, quite pleasing in colour and of good density. The paper is undoubtedly of very high quality, and we strongly recommend our readers to test it for themselves. Free testing samples are supplied to any *bona fide* professional photographer upon application to the London agent of the company, M. Jules de Gottal, 17, Cecil Mansions, Marius Road, London, S.W.17.

East Anglian Photographic Federation.—The annual meeting of this Federation was held at the Headquarters of the Cambridge and District Photographic Club on Saturday, November 4. The Federation is in a very flourishing condition, the number of clubs affiliated now being 100 per cent. more than in 1915. It was decided to hold the annual meeting and exhibition at Peterborough next year, and the annual combined excursion at Cambridge on Whit Monday. Mr. Edward Peake was elected President, and Mr. W. Farren, 76, Regent Street, Cambridge, Secretary and Treasurer.

New Apparatus.

The Korona Folding Studio Stand. Sold by Sands, Hunter and Co., Ltd., 37, Bedford Street, Strand, London, W.C.2.

For the purposes of the photographer who has to do work of any kind away from the studio, whether home portraiture or such commercial photography as the copying of paintings in picture galleries, a firm yet light stand for the camera, which can be conveniently used on polished floors, is a *sine qua non*. The requirements of the practical worker are most admirably met in this stand, which is exclusively supplied by Messrs. Sands, Hunter. One notable feature of the stand is the triple strut or stay which holds the three legs firmly in position and thus allows of the stand being moved about on a level surface without disturbing either the height or the level of the camera itself. Nobody who has used an ordinary tripod, say, for photographing pictures or for other copying work, will forget the immense amount of trouble that has to be taken in order to get one subject after another nicely placed and focussed. Probably more time is wasted in this branch of work by the use of the customary type of tripod than in any other way. Moreover, the three strut bars give extraordinary rigidity to the stand, so that it may be used, not only for cameras



but, in the larger of the two sizes in which it is made, as a support for a projection lantern of moderate size. A further excellent feature of the stand is that the central supporting pillar, which is of triangular section, is given a vertical sliding movement. By the operation of two set screws the camera may be lowered from its maximum height of 5 ft. to just over 3 ft.; and by a further spreading out the legs or drawing them in, a somewhat lower or higher position may be obtained.

The stand is exceedingly well made in cherry wood with non-tarnishable metal fittings. In the smaller size its weight is 4 lbs. in the larger, 6 lbs. The smaller size, which is recommended for cameras up to half-plate in size, is priced at £3. For cameras of larger size the No. 2 stand is recommended; its price is £3 10s. These prices include a detachable head, which takes the form of a tilting table, by which the camera may be inclined at any angle up to about 40 deg. Further tilting in any direction may be obtained by means of the sliding portion of each leg. Altogether the piece of apparatus is one which will render any photographer long and useful service in all descriptions of work done at such a distance from the studio that it is impracticable to make use of the heavy pattern of stand commonly employed for studio cameras.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

Monday, November 20.

Birmingham Phot. Art Club. "Composition." F. Smyth.
Bradford P.S. "The Making of a Lantern Slide." W. Bartle.
Dewsbury Phot. Soc. Members' Lantern Evening.
Forest Hill and Sydenham Phot. Soc. Print and Lantern Slide Competition.
Glasgow and West of Scotland Amateur Phot. Assoc. "The Process and the Exhibition Print." J. W. McKissack.
Kidderminster and District Phot. Soc. "Through Shakespeare's Country." Messrs. W. Butcher.
Southampton C.C. "Amateur Photographer" Prize Slides.
Walmsley Amateur P.S. "Holiday and Outings," 1922, Pictures.
Wallasey Phot. Soc. "The Chemical After-treatment of the Bromide Print." A. H. Redman.

Tuesday, November 21.

Royal P.S. "Astrological Portraiture." Alvin Langdon Coburn.
Birmingham Phot. Soc. General Meeting.
Bournemouth Camera Club. "Architecture and Architectural Photography." R.P.S. Lecture.
Burnley Mechanics' Institution Camera Club. "Hints to Beginners." F. Simpsons.
Cambridge and District Phot. Club. "An Egret Heronry in Andalusia." W. Farren.
Exeter Camera Club. "The New Forest." G. T. Harris.
Hackney Phot. Soc. "Health and Happiness in the High Pyrenees." Dr. C. Atkin Swan.
Leeds Phot. Soc. "Elementary Principles of Art applied to Photography." A. Keighley.
Maidstone and District Phot. Soc. "Psychology in the Studio and the Making of Portraits." C. P. Crowther.
Manchester Amateur P.S. "'Ilford' Lantern Plates." A. Brooker.
Morley Amateur P.S. "Making Lantern Slides." H. Walsh.
Nottingham and Notts P.S. "The Norfolk Broads." J. Sewell.
Portsmouth Camera Club. "Warm Tones by Development." Messrs. Wellington & Ward, Ltd.
South Glasgow Camera Club. "Auld Reekie."

Wednesday, November 22.

Birkenhead Phot. Assoc. "'Ilford' Plates and How to Use Them." A. Brooker.
Borough Polytechnic Phot. Soc. "Psychology in the Studio." C. P. Crowther.
Croydon C.C. "The Photographer and the Plate." C. M. Thomas.
Partick Camera Club. "The Chemistry of Developers and Development." W. M. Gregory.
Photomicrographic Society. Members' Evening.
South Glasgow Camera Club. "Development." W. W. Morrison.
South Suburban and Catford Phot. Socs. Discussion on Developers. P. B. Salmon.

Thursday, November 23.

Coatbridge Phot. Assoc. Print Night.
Edge Hill Camera Club. "Collected Notes on Pictorial Photography." J. R. Charlton.
Gateshead and District C.C. "Old English Monasteries." C. Young.
Hammersmith Hampshire House Phot. Soc. "Art and Photography." F. Judge.
Kinning Park Co-op. Soc. Camera Club. Scottish Photographic Federation Portfolio.
Letchworth C.C. "Nature and the Lens." A. R. Thompson.
North Middlesex Phot. Soc. "The Fascination of North Africa." C. H. E. West.
Richmond Camera Club. "Colour Slides." F. R. Newens.
Rochdale Phot. Soc. "Combination Enlarging." J. C. Wild.
Sun Camera Club (London). "The Story of the 'Cuckoo Spit.'" Dr. Geo. H. Redman.
Wimbledon and District Camera Club. A.P. & P. Prize Slides.

Friday, November 24.

Royal P.S. "The Fascination of North Africa." C. H. E. West.

Saturday, November 25.

Edinburgh P.S. Opening of Members' Exhibition. Social Evening.
Hackney Phot. Soc. The Lea Valley. W. Selfe.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, November 14, Dr. T. Slater Price in the chair.

The meeting was under the control of the Scientific and Technical Group of the Society, and papers were read by Messrs. K. C. D. Hickman, D. Norman Lawrie, and Mr. Rawling, on behalf of Mr. J. C. Keighley, who was not present.

The first paper concerned some experiments upon the tensile strength of gelatine and gelatine jelly, which had been made by Mr. Keighley, but, owing to the absence of the author much [illegible] concerning the results obtained was lost. However,

the results obtained in the experiments conducted upon jellies of known strengths were remarkable in showing a constant ratio in direct proportion to the square of the concentration. This was with jellies cast in 15 mm. tubes, but with dried gelatine from known strength jellies, the breaking load was not in so direct a proportion. In testing the latter types of gelatine, an ingenious method was shown. The jellies of known strength were poured while warm upon glass plates, and were then dried. The gelatine was cut into narrow strips upon the glass, and each strip attached to a small wooden handle. A loop was made at the other end of the strip, and here were attached the various weights, which were added to until the strip of gelatine ultimately broke. An interesting point was mentioned in connection with the soaking of dried gelatine in water. It was at first thought that heat would be absorbed, but this was found to be quite wrong, heat being actually evolved in the process. When 16 gms. of gelatine were placed in 250 gms. of water it was found that a total increase of temperature of .8 deg. C. occurred in 30 minutes, but this varied with different specimens of gelatine. In the discussion which followed Dr. Slater Price said, the author of this paper would have saved himself much work if earlier literature upon the subject had been consulted, but he was to be congratulated upon the simple manner in which he had explained and presented the results of his experiments. A hearty vote of thanks was accorded to Mr. Kingdon for his paper, and to Mr. Rawling, who had read the abstract.

Mr. K. C. D. Hickman then delivered his lecture upon rapid sulphiding of bromide prints. Mr. Hickman said the process he was now presenting was not a new one, but, perhaps, his method of working it was an improvement upon that which had been previously attempted. Of bromide toning processes in general the lecturer said that only one was of value to-day, and that consisted of darkening a bleached image with a sulphide. The other processes consisting of depositing metals, etc., upon the silver image had been given up, and the public now wanted only a good, cold sepia, such as the sulphide process, properly worked, would give. The lecturer discussed at some length, and with the aid of lantern slides, the cause of greenish-black images in bromide prints, and he explained that images of this kind gave very weak yellowish sulphide tones. It was therefore necessary to obtain, first of all, a good black deposit of silver, and this was only obtained by correct exposure and full development of the print. Mr. Hickman explained that halogen salts, as generally used in bleaching baths, were slight solvents of the silver image, pointing out that silver bromide was slightly soluble in potassium bromide solution. This fact accounted for a slight weakening of the high-light detail often found in toned prints, and it was with an idea of preventing this weakening that experiments with halogen gases were made. In the earlier experiments a damp bromide print was placed in a dish covered by a large sheet of glass. Bromine vapour was blown into the dish, and the print quickly bleached. The glass lid was then removed and the bromine vapour blown away. The lid was replaced and sulphuretted hydrogen in the form of the gas was then allowed to enter the dish. The bleached image immediately darkened and a fine tone resulted. But this process was of no practical value on account of the penetrating fumes of bromine and the noxious smell of the sulphuretted hydrogen. A type of apparatus which was next evolved, and which was exhibited on the table, consisted of a box having glass sides and a ventilation tube. This tube contained a gas jet, and by creating a current of heated air relieved the compartment of unused vapours. The experiments in which bromine was used proved that this substance was useless for the process owing to its power of attacking gelatine, and also to the fumes, more particularly of the atomic bromine liberated, which made the process unbearable. An interesting experiment was explained, in which coal gas was used to drive the hydrogen sulphide into the chamber. As a gas jet was burning in the ventilation tube, and gas and air allowed to enter the toning chamber, it could be quite understood that sooner or later an explosion would occur. This actually happened, and Mr. Hickman then decided to change the method and the substances used. Chlorine was used and was found far more satisfactory. A water driven ventilating fan was attached to the chamber, and the fumes were easily drawn off and dispersed without inconvenience to the worker. The bromide prints were first damped in water and blotted. They were then hung by celluloid clips upon glass rods, which were placed inside the chamber, and the glass lid fixed down. The chlorine was then blown in and the damp prints bleached very rapidly. The fan was then started and the lid of the box lifted to allow air to enter. After a few minutes the lid was replaced and the sulphuretted hydrogen blown in by means of carbon dioxide. The prints darkened at once, and gave good even tones of a cool sepia colour. A drawing of a new type of toning machine for cinematograph films by means of the above process was shown upon the screen, and its possibilities explained. In the discussion which followed, Dr. Slater Price said that it would be found that chlorine attacked gelatine nearly as strongly as bromine, so that care would have to be exercised in the bleaching of the film. A hearty vote of thanks was accorded to Mr. Hickman for his interesting lecture.

Mr. D. Northall-Laurie then proceeded to show upon the screen some interesting slides of chemicals and various sections made by means of the microscope upon Paget colour plates with polarised light. The lecturer had devised a method of showing the beautiful colours obtained with a polariser, actually changing upon the lantern screen. The device used consisted of a wooden slide, in which the positive image plate is mounted stationary, but the colour filter could be moved slightly over a small area either forward or backward by means of a screw. The results were very beautiful, and much admired by the audience. Mr. Northall-Laurie was heartily thanked for his lecture and for showing the results of his work, which, said the chairman, would be of great use when instructing students in both the use of the polariser and in connection with chemical crystallisation.

EDINBURGH SOCIETY OF PROFESSIONAL PHOTOGRAPHERS.

Meeting held on Monday, November 6. Present: Mr. J. Campbell Harper, Mr. George Balmain, Mr. George Ayton, Mr. W. B. Hislop, Mr. A. J. Hughes, Mr. Fergnason, Mr. John Thomson, Mr. Norman Thomson, Mr. W. J. Hutchieson, Mr. J. R. Coltart, and Mr. E. D. Young. Mr. J. Campbell Harper, the President, in the chair.

It was reported that the class for practical chemistry and optics had become defunct, owing to lack of studenta. This information was received with regret, as the class had acquired a considerable amount of success last year under the able tuition of Mr. Hislop.

It was resolved to postpone the holding of the annual dinner of the Society, which is usually held on the first Monday in December, until the apring. It was suggested that it might be held during the proposed exhibition in March. The President proposed, with the view of getting the assistants better acquainted with the objects of the Society and the membera interested in them, that a social evening and whist drive be held in January, to which all the assistants in the employment of membera would be invited. This was unanimously agreed to, and Mr. John Thomson, Mr. George Balmain, and Mr. Wm. Fergusson were appointed a committee to make the arrangements.

The rates for supplying electric current for power to professional photographers was next on the agenda, but as the evening was so far advanced it was agreed to delay discussion until next meeting. The President pointed out that before they could approach the Corporation authorities it would be necessary to get definite information as to what concessions professional photographers in other towns obtained from their Corporations. Mr. Hislop mentioned that he had been informed that until the new power station was ready and in full swing the Corporation would not consider the granting of any concession, as the electrical power was needed for other purposes.

CROYDON CAMERA CLUB

The Annual Dinner at the Greyhound Hotel proved to be the usual enjoyable function, a large number of members and guests turning up. With speeches at the minimum (excepting one oration) and good cheer at the maximum, all was well indeed.

After the loyal toast, a silent one was offered to the memory of a departed comrade, Mr. H. T. Dodsworth, an ex-President, who in the past worked hard for the club. He is sadly missed. The President, Mr. John Keane, in proposing "The Visitors and Press," alluded gracefully to the cheery Mr. A. C. Brookes, and wished him all success in his new venture at the Holland Park Rink. Mr. Tilney he referred to as the finest art critic in photographic circles, and all, he said, would welcome Mr. S. Bridgen, the hard-working chairman of the Affiliation. The unavoidable absence of the "Walrus" and other old friends was much to be regretted. On the other hand, they had the pleasure and gratification of again having among them the editor of the most important photographic paper in the world—Mr. Geo. E. Brown. Unanimously the Council had decided to ask him to accept an honorary life membership of the club. (Loud applause.)

Mr. Brown, in reply, said he could not sufficiently express his feelings for the honour done him, and immediately followed

with a more than adequate elucidation. The secret of the club, he continued, baffled time, it being based on perpetual good-fellowship, which nothing could extinguish. In fact, he regarded the club as one of the healthiest things existing in the photographic world. He regretted the absence of Mr. Child Bayley, who was in America. Doubtless many had noticed, without guessing the cause, that the *Aquitania* had recently been delayed in transit across the "pond." Mr. Mortimer, he understood, had started pigmenting a Bromoil, and thus was unavailable for an indefinite period.

Mr. Tilney, looking as sober as a judge, stated he was submerged, but soon rose to the surface and contributed an amusing speech. As did Mr. Bridgen in parts. Much too solid information, however, was afforded about the past, present, and future of the Affiliation, which is expanding and prospering. Obviously a kind personality, and on this his first visit, all was forgiven him.

Then came a surprise presentation to the President, on which hangs a tale. Some little while ago, in one of the club's reports, a not altogether flattering allusion was made to his latest pipe of peace. Shortly afterwards the Secretary, Mr. Sellors, received through the post a really beautiful specimen, and, thinking it was a present from some rich relative, felt highly "bucked." A perusal of an anonymous letter enclosed in the parcel came as a sad damper, for the generous donor requested that the pipe be presented to the President for the sake of the lesser lights compelled to sit in his vicinity. Evidently it was overlooked that any benefit derived from the abatement of an undoubted nuisance will be counterbalanced by the creation of sinful feelings of covetous envy. But, given a sufficient number of readers of the *B.J.* filled with the same charitable instincts, the incident seems to open out delightful possibilities for the future. The thing will, of course, require delicate handling to avoid suppression by editorial powers that be. Needless to say, Mr. Keane expressed surprise, etc., and many thanks to the unknown donor.

In the entertainment line the singing of Miss Cecil Lucas was a real joy. Possessed of a glorious contralto voice, a successful future seems assumed. Mr. Godwin Bennett's fine tenor was another treat. Mr. Tayler's poison-gas contribution on the gazoophone, unhappily, will not readily be forgotten. Merry and bright as a drum-and-fife band was Mr. Kelfer's contribution. Mr. Tilney's cultured and sympathetic baritone voice was hardly at its best in a comic song, but he prospered, as did Mr. Ackroyd in a topical ditty. In orthodox adoring style Mr. Green rendered a love plaint in which "the stars grew cold and grey"—the right romantic spirit if a little inaccurate in celestial details. Mr. Harpur also loved someone "with a love that cannot die," and incidentally demonstrated the structural stability of the building. Altogether a most enjoyable evening.

Commercial & Legal Intelligence.

EASTMAN KODAK COMPANY.—The directors have declared the following dividends, payable to stockholders of record on November 20:—Extra dividend of $0.50 per share of common stock payable December 30, 1922; regular dividend of 1½ per cent. on preferred stock payable January 2, 1923; regular dividend of $1.25 per share of common stock, payable January 2, 1923.

CHRISTMAS MOUNTS.—The sample set of Christmas mounts for postcards which reaches us from Messrs. Jonathan Fallowfield, Ltd., 145, Charing Cross Road, London, W.C.2, are of extremely good design and quality. Made in various thicknesses of card and with tasteful combinations of tints, they should prove a good attraction for the Christmas trade. The mounts have various greetings embossed upon the front cover, and some have, in addition, small sketches and designs. The sample set of these mounts, comprising twelve patterns, is supplied to professional photographers for 2s. post free. As an addition to the above series, Messrs. Fallowfield are supplying a series of larger calendar mounts for postcard prints, all produced in the same excellent style. These mounts are of high artistic quality, while the calendars attached are of ample size. Four patterns are supplied in this series, and a sample set, containing one of each pattern, may be obtained for 2s. post free.

News and Notes.

ISLINGTON PHOTOGRAPHIC SOCIETY.—It is proposed to form a photographic society for Islington and Holloway, and persons interested are asked to communicate with Mr. Len Balston, 30, Ashley Road, Crouch Hill, N.4.

ALDERMAN FREDERICK SPALDING, head of the firm of Frederick Spalding & Sons, High Street, Chelmsford, has been elected Mayor of that borough. Mr Spalding has been a member of the Chelmsford Town Council for over thirty years, and is to be congratulated on the honour done to him by the representatives of his native borough.

ECLIPSE PHOTOGRAPHS.—The October issue of "Harringtons' Photographic Journal" contains reproductions of some excellent photographs of the recent eclipse of the sun as seen from Stanthorpe, Queensland. Two photographs, each taken on a Wellington Anti-screen plate, with a K2 filter, show the corona at its best. The exposures were made by Mr. W. Kimbel, of the Sydney "Sun" newspaper.

THE CAMERA CLUB.—The winter session of the London Camera Club, in addition to including a series of weekly lectures on many subjects of interest, comprises also demonstrations of photographic processes, and also a continuous sequence of house exhibitions in the lounge of the club at 17, John Street, Adelphi, London, W.C.2. That for the present month is of portraiture by Mr. N. E. Luhoshey. Tickets of admission to view the exhibition may be obtained on application to the hon. secretary, Mr. Robert M. Cocks.

QUICK METHOD OF MAKING BLUEPRINTS.—In places where the facilities for making blueprints are lacking, the following method (says "Popular Mechanics") can be used to produce satisfactory results: Instead of making the original drawing on tracing cloth, use a piece of paraffined tissue paper, which is backed up with a piece of new carbon paper. The waxed paper is placed over the carbon, so that pencil marks on it will be intensified by the carbon reproduction on the underside. The sketch is made in pencil, and the lettering can be printed in on a typewriter, still using the carbon. When finished, a print can be made from either the sketch intensified by the carbon backing, or from the carbon sheet itself. Blueprints made from the sketch will show white lines on a blue background, while prints made from the carbon copy will have a blue line on a white ground.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

DARK ROOM LIGHT FOR BROMIDE PAPER.

To the Editors.

Gentlemen,—I was much interested in Messrs. Ilford's contribution to the correspondence under the above heading, as it confirms a [illegible] I have long held that some bromide paper is appreciably colour sensitive.

Some time ago I was testing the illumination of a dark room having direct light from a Wratten "O" safelight and from a "100" reflected from the ceiling. I used two brands of paper—Kodak rapid and Illingworth Normal de Luxe, the former being considerably faster than the latter.

Half of a strip of each was exposed on the bench for five minutes and then developed in darkness for three minutes. The fast paper was perfectly clear, while the slow grade was appreciably fogged in the exposed portion. The solution would appear to be that the slow paper was more colour sensitive.

As I must confess to not having taken the trouble to repeat the observations, I do not put too much faith in them, but Messrs. Ilford's remark seems to confirm the possibility of this solution.

Yours truly,

J. AINGER HALL.

Imperial College of Science and Technology, South Kensington, London, S.W.7. November 13.

HECTOR MACLEAN.

To the Editors.

Gentlemen,—The Croydon Camera Club is very desirous to obtain a really good portrait of the late Hector Maclean, to hang in its meeting-room, as a permanent memento of one who took a leading part in its activities for many years.

We should be very grateful to anyone who would be good enough to supply us with a cabinet portrait for the purpose, or with one that we could have a copy made from.—Yours faithfully,

J. M. SELLORS,
Hon. Secretary.

50, Russell Hill, Purley, November 14.

SILHOUETTES BY REFLECTED FLASHLIGHT.

To the Editors.

Gentlemen,—It is often found when taking portraits against a white sheet, illuminated from behind to obtain silhouette effects, that considerable creeping of light occurs around the edges of the figure. This spoils the clean-cut effect of the outline, and necessitates reducing the negative, so that a passable result may be obtained. Also uneven patches often occur upon the sheet, due, probably, to the light penetrating the sheet unequally. With the intention of overcoming these difficulties I have recently made several experiments, and a process which has proved extremely successful, and has given excellent results, has been devised. An opaque white background is hung against the wall of the studio. In front of this, at about four feet distance, is the sitter, who faces right or left to obtain the profile effect. At a distance of two feet from the background and on either side of the sitter is placed an opaque screen, its position being so arranged that the edge nearest the sitter is just outside the field of view of the lens. The flash, which should be about 30 grains of powder for head and shoulders, is made from behind the opaque screen towards the background and at a position which approximates to the level of the sitter's head. The screen is thus illuminated strongly by the flash and will be found to be evenly lighted. It is necessary that all reflecting surfaces which are likely to throw light upon the sitter's face should be covered, or, in the case of white reflectors, removed from the studio.

Yours faithfully,
"REFLECTOR."

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

F. P.—We should say that you will get at least as quick printing by using a 70 to 100 c.p. Osram or similar lamp at the same distance from the negatives.

M. R. P.—The lens is of far too short a focus. The focal length we prefer is 6 inches for a ¼-plate camera, and often we use one of 8 inches. The general rule is to use a lens of not shorter focus than the diagonal of the plate, but this may be exceeded with a corresponding gain in the rendering of portraits.

S. H.—Two restorers of Daguerreotypes on our books are:—W. B. Samuel, 30, Hampton Street, Walworth, London, S.E.17, and Charles Debenham, 222, West End Lane, Hampstead, London, N.W.6. We have frequently referred people to both of these and we believe they do the work satisfactorily.

K. V.—We should recommend the use of a weaker developer. It is often found that a developer diluted with an equal volume of water will do more in rendering shadow detail than the usual strong solution. In cases of over-exposure, as in white dresses, the water bath is a handy method, allowing the shadow detail to develop while checking the high light.

THISLE.—We expect it means that a molar solution is a molecular weight in grammes of the substance dissolved in 1,000 c.c.s. of water. Silver nitrate, having a molecular weight of 170, a molar solution would be 170 gms. in 1,000 c.c.s. of water, and the solution specified would be one containing 170 × 0.37 gms. in 1,000 c.c.s. water. We do not think the silver solution is one made with ammonia, but simply the ordinary silver nitrate.

WARM BLACK.—The papers which are now available for the obtaining of warm-black tones are slightly slower than ordinary bromide paper, yet it is quite possible to make enlargements upon these slower papers, providing a not too dense negative is used and a fairly strong illuminating source is available. For developers we find the borax M.Q. is as good as any, while the pyrocatechin gives excellent results. A formula for the latter will be found in the "B. J." Almanac for 1922, p. 451.

W. J. A.—As regards general practice in making news photographs, you might be very well guided by a little handbook, "Photography for the Newspapers," by John Everard, out of print just now, but no doubt obtainable second-hand for a shilling or so from Messrs. W. & G. Foyle, Ltd., 121-125, Charing Cross Road, London, W.C.2. You can insert the titles in the way you describe. It is done by commercial makers of these kinds of slide. The title portion may either be written by hand on the celluloid or printed thereon from type. Naturally, the latter method makes a very much neater job.

W. V.—The position is not a very promising one, but if the surrounding walls are kept whitened it will probably be possible to do fairly good work. If this is not sufficient, outside reflectors close to the glass may be used. The amount of glass should be as recommended on page 16 of the "Portrait Studio." Considering the narrowness of the studio, the whole width of the roof should be glass. If possible to have a greater width than 10 ft. it would be desirable to do so. The angle of roof should not be greater than 30 deg. This will mean between 5½ and 6 ft. difference between eaves and top. A flatter roof would be better, but would hold snow too long, besides being difficult to keep free from drip.

G. F. D.—We do not know of a method of "fixing" the dye in stained films for three-colour processes, and we hardly think this should be necessary if the proper dyes are used and the washing reduced to a minimum. If you are working the Sanger-Shepherd process or the Pinatype process, the gelatine image should be so prepared before dyeing that very little washing is necessary, and hot water should not be needed at all after the film is dyed. Possibly the dyes you are using are not satisfactory, the ordinary type of aniline colour proving useless for these processes. This may also account for the colours fading by the action of light. The "Renaud" printing box was made by Marion & Co. and could be obtained for various negatives up to 15 by 12. We should think you could obtain one of these boxes for the size negative you wish to use from the Amalgamated Photographic Manufacturers, Ltd., 3, Soho Square, London, W.1.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3264. Vol. LXIX. FRIDAY, NOVEMBER 24, 1922. Price Fourpence.

Contents.

SUMMARY

In a contributed article Mr. D. Charles describes a system of ascertaining the exposures required when copying originals upon various scales; at the same time a system which is easily within the capacity of a comparatively unskilled copyist. (P. 709.)

Mr. E. A. Dench describes some schemes of window display used by portrait photographers in the United States and elsewhere. (P. 712.)

Results which are defective owing to reflections are encountered not only in photographing glazed paintings, etc., but with other originals in which frequently reflection trouble would not be suspected. An instance is given in a paragraph on page 706.

An exhibition of many notable works by the accomplished portraitist, Mr. N. E. Luboshey, remains open at the Camera Club until the end of the present month. (P. 713.)

In a short studio the difficulty of obtaining a sufficiently great distance between camera and sitter may sometimes be overcome by the use of a mirror. (P. 706.)

In a paragraph on page 705 will be found a caution against undue lowness of temperature of the developing solution in the cold bath process of platinum printing.

The waste incurred by faulty apparatus, a studio fire extinguisher, and the painting of sheet zinc are the subjects of "Assistants' Notes." (P. 713.)

The conclusion of the paper from the Eastman Research Laboratory, in which Dr. S. E. Sheppard reviews the progress which has lately been made in our chemical knowledge of gelatine, will be found on page 710.

In a leading article the writer, Dr. T. Slater Price, usefully supplements Dr. Sheppard's paper by providing an explanation of many of the scientific terms which have come into use in the investigation of gelatine and other colloid substances. (P. 706.)

A formidable process has been patented in Germany for the toning of P.O.P. without gold. Prints are treated in a large number of baths, among which are a sulphide and a selenium solution. (P. 706.)

A process, Neography, is described in a recent issue of "Camera Craft" as possessing qualities of latitude which out-distance those of the Bromoil process and also allow of advantage being taken of photographic detail. (P. 708.)

Details of the construction of an f/2 anastigmat lens are given in a recent patent specification. (P. 714.)

Particulars of the duties levied on various classes of photographic goods imported into the United States are given on page 718.

EX CATHEDRA.

Temperature in Platinum Development.

Although the paper now generally used for black platinum prints is known as the "cold bath" variety, it may be pointed out that the coldness of the developing solution should not be extreme. We have several times found that a very cold solution, say, between 40 degs. and 50 degs. Fahr., has yielded poor, flat granular prints, the defect disappearing when the bath was heated to 65 degs. or over. There is no necessity for warming the acid baths or the washing water, since the absence of a gelatine film precludes the possibility of blisters occurring by the sudden transition of the prints from a warm solution to a cold one. It is perhaps, advisable to give a slightly longer immersion in the acid during cold weather, as nearly all chemical action is delayed by a low temperature. It is not wise to use the acid stronger than the 1-80 solution recommended by the makers; a stronger solution tends to remove the size from the paper, and make it very tender to handle, besides more or less roughening the surface.

* * *

Sulphide-Selenium Ton of P.O.P.

Methods of toning P.O.P. prints without gold have been heard of from time to time in the past, yet the use of a sulphide bath, which has been the most commonly recommended process, has never obtained a footing in everyday practice. A variation, or perhaps we ought to say a complication, of this process has, we notice, been evolved by a German firm, the Graphikus Gesellschaft of Hamburg. According to the details, which are given in the German patent specification, the process has reached a forbidding degree of complexity. The P.O.P. requires to be greatly over printed and is first fixed in an 8 per cent. hypo bath containing a half per cent. of potass metabisulphite. Without intermediate washing, the prints are then passed into a similar bath except that the metabisulphite is omitted. They are then well washed and ready for toning. They are first treated in a solution made by soaking up 20 gms. of barium sulphide in a litre of water, pouring off from any deposit and adding 30 c.c.s. to 1,000 c.c.s. of water with addition of 10 c.c.s. of ammonia. In this bath the prints quickly assume the characteristic gold tone. They are passed through a stop bath of permanganate solution (which is renewed several times), again washed and then subjected to the action of a selenium toning bath. This latter is compounded from 35 gms. ammonium hyposulphite, 0.32 gm. of sodium seleno-sulphate and 15 gms. sodium sulphite dissolved in a litre of water with addition of a little ammonia. In this further bath the prints reach a black to brown-black tone, passing on longer immersion to a greenish-black. As soon as the required tone is obtained, the permanganate stop bath is again used and

washing finally done in two or three changes. Although no doubt the production of agreeable tones on P.O.P. prints without the aid of gold has a certain importance, it can hardly be thought that either practical users or experimenters will be encouraged when it is seen what a fearful sequence of operations is required in order to obtain results which, presumably, are satisfactory as regards colour, whatever they may be as regards permanence.

* * *

Mirrors for Short Studios. It is often necessary to work in a very confined space, either when making at-home portraits or where no better accommodation can be found for professional portrait work. We recently were asked to advise upon the possibility of using a room only 11 ft. 6 in. long as an artificial-light studio. This distance is manifestly insufficient for satisfactory full-length work, but by adopting the old device of photographing the image of the sitter, as reflected from a mirror, a considerably greater working distance may be obtained. In a 12-ft. room a mirror 3 ft. high will allow the camera to be placed nearly 5 ft. away from its surface, and still embrace an angle sufficient to cover a full-length figure. It must be remembered that in this case the space occupied by the camera and operator does not have to be allowed for, and therefore the additional distance is all clear gain. It is not found that, working with a narrow angle between lens and sitter, double reflection causes any trouble, while the lateral inversion of the image is readily overcome by using cut films and printing through the celluloid.

* * *

Colour and Density. It is very necessary when printing on bromide paper from mixed batches of negatives to make due allowance for the difference in printing value, due to the use of a developer which gives a yellowish image or even a general yellow stain, and one which gives a pure black negative. It is very desirable, therefore, that negatives should be sorted out into classes by a white light, daylight, by preference, failing which a small arc or a new half-watt lamp will serve. If it be attempted to judge the colour of negatives by an ordinary incandescent lamp, there is great danger of underestimating the density of the yellow ones, with the result that paper is needlessly wasted. We recently encountered some old thin-looking pyro-developed films which were to be enlarged. On making a strip test it was found that (all other conditions being equal) they required four times the exposure, which was sufficient for brilliant non-stained images.

* * *

Surface Reflections in Copying. Every photographer is aware of the necessity for avoiding reflections when copying pictures under glass or those having a perceptibly glossy surface, but there is a more insiduous kind of reflection which often passes unnoticed and causes poor, flat results for which there is no apparent reason. There are many stages between an absolutely matt surface and a decidedly glossy one, and it is very easy to overlook quite a considerable amount of reflective power in both the surface of the paper and the ink or pigment of which the image is composed. In an example which came under our notice this week, the original from which a reduced negative had to be made, was an impression from a line block upon "imitation art" paper. The negative was correctly exposed, but looked flat, the black lines which should have been clear having a slight granular deposit upon them. Upon careful examination of the original this was found to be due to reflection from the surface of the black ink, which was glossy in some places and matt in others. On shifting the position of the camera and copy-board a perfectly satisfactory result was obtained.

THE CHEMISTRY OF GELATINE.

THE paper of Dr. Sheppard is an illustration of the rapid advances which are now being made in the application of strictly scientific methods to photographic problems. In reading this paper the ordinary reader of the "B.J." may very readily become confused, however, since he will find scientific terms of which he does not know the meaning, used in great profusion. To explain all these terms would need more space than can be allotted to this article, so that only the more important can be dealt with.

First, as regards colloidal solutions. The word colloid is derived from the Greek word κολλα, meaning glue. This derivation would indicate that a colloid is a substance of very complex constitution, such as is glue, and at the time when this name was first used by Graham, this was indeed supposed to be the case. This, however, is by no means true, so that the meaning of the term colloid is now quite different from what it was in Graham's time.

It is well known that if a solution of arsenious acid (white arsenic) is acidified with hydrochloric acid and then hydrogen sulphide passed in a yellow precipitate of arsenious sulphide is obtained. If, however, a solution of white arsenic in water is mixed with an equal volume of an aqueous solution of hydrogen sulphide there is no formation of a precipitate, a perfectly transparent, somewhat orange coloured solution being obtained. This solution can be filtered without leaving a residue on the filter paper, and does not settle out on keeping for quite a long time. If, however, a strong beam of light is passed through the solution its path will be shown up very clearly, just as the ray of sun-light is made evident by the dust particles in the air. Pure water, or the solution of an ordinary salt, would not show up the beam of light in this way so long as there were no suspended particles in the water or solution.

This experiment indicates that what is apparently a true solution really contains particles of an insoluble substance suspended in it. Now it is well known that the more finely-ground an insoluble substance is, the longer it takes for it to settle out when shaken up with water, and it is an easy thing to imagine that if it is ground sufficiently finely it would remain in suspension for an indefinitely long period. This is exactly what is assumed to be the case with an orange coloured solution referred to; arsenious sulphide has been formed but in such very fine particles that the solution remains clear to the eye, and no precipitate settles out. The arsenious sulphide is said to be in colloidal solution. Similarly, other substances can be obtained in colloidal solution, and those of silver, gold and the silver halides are especially interesting to the photographer.

In most colloidal solutions the existence of the particles cannot be demonstrated by the highest power microscope, but by the use of the ultra-microscope their presence can in most cases be demonstrated; they are then known as *submicrons*. Those which cannot be rendered visible even by the ultra-microscope are spoken of as *amicrons*. The particles suspended in the colloidal solution are called the *disperse phase:* they are suspended in the *dispersion*

medium (which may be other than water), and their degree of subdivision is known as their *dispersity*.

So far, reference has been made only to colloidal solutions which consist of solid particles in a dispersion medium; such may be called suspension colloids, or *suspensoids*. Suppose now we take an emulsion such as cod liver oil emulsion, or milk; if it is examined under a microscope it will be seen to consist of drops of one liquid suspended in another liquid. If it were possible to reduce the size of the liquid drops to colloidal dimensions we should have, according to Wo. Ostwald, a colloidal solution consisting of liquid particles in a liquid dispersion medium. Substances which give colloidal solutions of this kind, such as gelatine, starch, etc., are called emulsion colloids, or *emulsoids*. This method of consideration has been given for the sake of simplicity, but the constitution of emulsoids is still a matter of controversy, although ideas seem to be tending in the direction of a fibrillar structure (see end of Dr. Sheppard's paper).

Colloidal solutions are generally spoken of as *sols*, so that we may have a suspensoid sol or an emulsoid sol. In the case of gelatine it is well known that when the sol is cooled down it sets to a jelly, whereas no such change takes place with a suspensoid sol, such as that of gold, when treated in the same way. Such jellies are called *gels*, and when water is used as the dispersion medium this is indicated by the terms *hydrosol*, and *hydrogel*. Moreover, the change from sol to gel is reversible, since on warming the jelly it liquefies readily to a sol.

Next, the *gold numbers*, referred to by Dr. Sheppard, call for a few words of explanation. The particles of gold in a gold sol have a size varying from 10–40$\mu\mu$ ($\mu\mu$ = 10^{-6} mm.). If to 10 c.c.s. of a red gold sol 1 c.c. of a 10 per cent. solution of sodium chloride is added, the colour changes from red to blue, and further addition of sodium chloride will precipitate out the gold in flocks. (Such precipitations are characteristic of suspensoid sols.) If, however, a sufficient quantity of gelatine is added to the colloidal gold solution, the addition of 1 c.c. of 10 per cent. sodium chloride will not bring about a change of colour or precipitation, that is, the gelatine prevents the gold from being coagulated; in other words, it acts as a protective colloid.

It is found that different emulsion colloids, e.g., gelatine, casein, gum arabic, etc., have different protecting effects on the gold sol, these protecting effects being represented by what is known as the *gold* number. By this *gold* number is understood the number of milligrams of protective colloid that may be added to 10 c.c. of the gold sol without preventing a change of colour from deep red to violet shades when 1 c.c. of a 10 per cent. solution of sodium chloride is added.

To turn now to the terms *isoelectric point*, p_H, etc. Salts, acids and bases when dissolved in water confer upon the solution the power of conducting electricity; such substances as alcohol, urea, etc., do not have this power. The former are called *electrolytes*, and the latter *non-electrolytes*. According to modern theories, electrolytes have this power because when they are dissolved they split up (*dissociate*) more or less completely into parts which are electrically charged, there being an equal number of positive and negative parts, so that the solution remains electrically neutral. For example, hydrochloric acid gives the parts H^+ and Cl^-, whilst sodium hydroxide gives Na^+ and OH^-. These are generally written, H', Cl', Na', OH', and are called *ions*, the positively charged parts being *cations*, and the negatively charged, *anions*. Substances which produce ions in solutions are called *ionogens*. H'ions, or *hydrions*, confer acid properties on a solution, whereas OH'ions, *hydroxylions*, confer basic properties. If an electric current is passed through such solutions the cations wander towards the cathode and the anions towards the anode. Generally speaking, if a substance possesses acid properties, it does not at the same time exhibit basic properties. It is well known, however, that such a substance as aluminium hydroxide will dissolve in either hydrochloric acid or in sodium hydroxide, that is, it acts as a base towards the former and as an acid towards the latter. Such a substance is said to be *amphoteric*. Gelatine will act as a base towards acids and as an acid towards bases, and is therefore an amphoteric colloid. If, then, it is present in hydrochloric acid solution, the salt GCl will be formed, where G represents the gelatine residue, and this will give the ions G' and Cl'; if this solution is electrolysed the G'ions will migrate towards the cathode. If dissolved in sodium hydroxide, the salt NaG, giving the ions Na' and G', will be formed, and on electrolysis the G'ions, that is the gelatine, will migrate towards the anode. Pure gelatine itself is a stronger acid than a base, that is, in pure solution the few ions formed are mainly H' and G', and therefore the gelatine will wander to the anode on electrolysis. Now by the addition of an external acid to the solution it can be shown that the stretch of the gelatine as an acid will be decreased; and if the proper quantity of this external acid is added there will come a time when the gelatine is equally strong as an acid and as a base. On electrolysis of such a solution there will be no preferential wandering of the gelatine either to the anode or cathode, i.e., the gelatine is said to be *isoelectric*, and the solution is at the *isoelectric point*. When in this condition the gelatine has peculiar properties, showing a minimum swelling power, the solution has a minimum viscosity, etc.

The hydrion concentration (C_H.) of the solution when the gelatine is isoelectric is 2.5×10^{-5}, that is, in 1 litre of the solution there are 2.5×10^{-5} gram hydrion. These hydrion concentrations are usually expressed in another way, due to Sorensen, so that they can be compared more easily. For example, it is not easy at first sight to compare such a series as :—

1×10^{-5}; 4.0×10^{-6}; 1.6×10^{-6}; 6.3×10^{-7}.

This series may, however, be written as :—

10^{-5}; $10^{-5.4}$; $10^{-5.8}$; $10^{-6.2}$

and the order of acidities is at once obvious. In genera practice the 10 is omitted, since it is common to all, and the hydrion concentration expressed by the *minus* logarithms, which are merely the reciprocals of the logarithms of the hydrion concentration, and are generally written —log [H'], or, more simply, p_H (or P_H or p_H). It follows that the greater the hydrion concentration of a solution the less acid it is.

In the case of gelatine the p_H of the isoelectric point is thus 4.7. In pure water, which is neutral, there are hydrions and hydroxylions in equal concentrations of 10^{-7} at 25 degrees, so that the p_H of pure water is 7.

It is hoped that the above will explain a number of the points mentioned in Dr. Sheppard's paper; there are still such terms as "transition point," "Ostwald ripening," etc., but this article is already too long for the space allotted to me by the Editor. A number of points in connection with gelatine are dealt with more in detail in an article published in the August number of the "Photographic Journal," and a summary of the literature on gelatine is given in a report of the Adhesives Research Committee which is being published by the Department of Scientific and Industrial Research, and is now in the Press.

T. S. P.

NEOGRAPHY—A PROCESS OF MAKING TRANSFER PRINTS IN PIGMENTS.

Those who may feel that, among photographic control processes, Bromoil does not allow them enough latitude for the exercise of such technique of draughtsmanship or painting as they may possess, yet nevertheless do not desire to cut themselves adrift from photography, should find their wants met by a process to which the name of "Neography" has been given by its inventor, Mr. James Carl. Our San Franciscan contemporary, "Camera Craft," gives a general description of this process, from which it appears that a drawing or tracing upon a transparent material, containing gelatine in its composition, is worked upon with a stylus and the intaglio lines then linked with a pigment, which apparently should be an oil colour. An impression by contact may then be taken. Our contemporary writes appreciatively of the process after having seen results by it, and suggests methods by which it may be combined with the photographic image.

Neography, though not a photographic process in itself, yet is so closely allied to photography that we are confident it will interest all those photographers who have a liking and an aptitude for drawing. The possibilities of this process in conjunction with the camera are so inviting, we think many will immediately recognise its value. We particularly draw the professional photographer's attention to neography, he will grasp the possibilities of the process in supplying him with that "something new" for the holiday trade.

We have examined several neograms both in monochrome and colour made by Mr. James Carl, the inventor of neography. They were most artistic; these pictures had been on public exhibition in this city, and had won much praise. The process is really simple in itself, but it is the man behind the stylus and the rag that counts.

Neography is a name given to a new printing process by Mr. Carl, and means a new graphic method. This method enters into every field of the printing processes, such as etching, mezzotint, aquatint, and others besides photography. To photographers it supplies manifold mechanical means of printing effects hitherto unknown. It enables the photographer with but an elementary knowledge of drawing to produce etched portraits of landscapes, mezzotint or monotypes so much in vogue in the art world, permitting him, if he chooses, entirely to obliterate the photographic hall-mark of his print and to substitute a purely individual treatment which may be transferred to any paper, leather, silk, or to any other suitable surface.

Neography enables the worker to control his product, that is, to add or eliminate effects according to fancy. He is able to print in any colour, in monochrome or even in multicolour with the use of one plate, and really beautiful effects may be secured thereby. We have no hesitancy in attesting to this as we have seen these multicolour prints. "Camera Craft" is the first publication to be able to give its readers an account of Mr. Carl's beautiful process. He wishes all workers to become familiar with it, both amateur and professional, because of its possibilities.

Neographic prints (or neegrams) are made in the following manner. A combination of celluloid and gelatine is used. The material being transparent can be directly traced upon by placing the design or photograph beneath it and tracing the outline of the original, in this case the photograph, with a needle or stylus. The work is done on the gelatine side, and the lines are scratched and show sunken in the gelatine surface. We may confine ourselves to mere outline, or we may elaborate our work with shading either now or at a later time. The plate when inked is ready for printing, but unlike the old etching process on metal, a photographer's burnisher is used in place of the costly printing press hitherto necessary for reproduction. It will be noticed that there is a certain similarity between this tracing with a needle upon the gelatine-coated celluloid and the scratching or engraving into the copper plate in "dry-point" work. Indeed, if the photographer so wished he could produce an entire portrait in pure lines similar to portrait etchings now existing, but this requires artistic ability. The practical method for the average photographer is as follows:

Let us presume it is to be a portrait. Make a print, place this under the etching material and trace outlines, eyes, hair and such parts of the drapery as the operator wishes to produce. Rub some black or red oil paint, tube colour, into the traced lines, wipe the plate with a cheese cloth so as to clean it, without disturbing the pigment retained in the lines. We now have a picture in opaque lines upon a transparent material. Now, make a negative by contact on a cut film from this transparency.

The next step is to print your portrait from the original negative, but very lightly, showing only slight modelling and faint graduations, then print through the etching negative made from the celluloid tracing upon this original print (double printing): the result should show a very artistic portrait in etched effect. The registration of the two negatives is really not difficult if we adopt a system of guide lines or make a practice of printing with the same two sides of printing frame to register by. On the other hand, the photographer who is an expert copyist may have recourse to copying the first finished print, and thereby duplicate his original without recourse to double printing. It would be probably better if the photographer would confine himself to one, perhaps two, original prints, and push this as a novelty and charge accordingly, rather than to manufacture several copies which would only cheapen the work.

A slower method, but a more artistic one, is to print direct from the celluloid plate on top of the photographic print. There are certain technical points to be observed to make this a success. We must make a reversed print from our portrait to begin with. If the negative is on film, this reversal is simplicity itself by printing from its back. From this print the tracing is made, and when the celluloid plate is etched and inked it is printed from, and that printing reverses the portrait to its original position. The ink to be used in this work is the same as that employed by etchers for printing from their intaglio plates. The transfer of the inked lines to the photographic print is accomplished by passing it in contact with the plate through the burnisher. We might add that where the photographer desires to try this method he should adopt a printing paper of matt surface to secure the best effects.

One of the most valuable aspects of neography is that the photographer or any artist can engrave from his photograph or drawing, then colour the etched plate with various inks, and then transfer the multicloured picture to a sheet of plain paper by passing it through the burnisher or by aid of a letter press. With the latter a rubber blanket must be used.

EXPOSURES IN COPYING

PROVIDED that it is possible to illuminate the copying easel with lamps of sufficient brilliance to enable them to be retained at a fixed distance from all originals, and also to arrange for standard conditions in the dark-room, there is no reason why copying should not be carried out either continuously or very intermittently without errors in exposure. Several writers have dealt with the classification of originals, so that I need not dwell on this point, except to say that my method takes as its basis the copying of an "average" bromide print, and other classes of originals have given to them definite factors for multiplication or division. This, let me say at once, is all the arithmetic that is required in working a quite satisfactory system.

Practically all the confusion and error arise from the fact that the stops as marked upon a lens have very different values when employed in copying work, and the calculations usually proposed to overcome this difficulty are not only cumbersome but usually also are beyond the average junior assistant, more especially when more than one lens is used at varying extensions.

The system which I worked with considerable success for quite a long time was initiated by standardising the power and position of the lamps at the start. Then a lens was put on the camera with a diaphragm aperture of an inch. That is to say, it was probably an eight-inch lens with the iris set at *f*/8, or else an eleven-inch with the stop at *f*/11. The camera was extended so that sixteen inches was the distance from the stop to the ground-glass, and then was slid to and fro (without altering the extension) until some matter upon the easel was sharp. Thus the result obtained was that the actual value of the stop (of one inch actual diameter) was *f*/16. An "average" print was then pinned up and a plate exposed in steps and developed for a given time, and the correct exposure noted.

A sheet of paper was then inscribed with the ordinary apertures from *f*/6 to *f*/45 in a column. Opposite *f*/16 was written the exposure arrived at by the test as just explained. Opposite each other stop was written, in round numbers of course, the proportionate exposures for all the other apertures in the list, by the ordinary rule of halving for each stop larger, and doubling the exposure for each stop lower. As a matter of fact, as the lights were not of great brilliance, a little extra was added to the theoretical exposures for the smaller stops.

This procedure was repeated with a line subject upon a process-plate, and the corresponding exposures marked against each stop. Note that only one test was made in each case, that of an extension of sixteen inches with an actual aperture of an inch in diameter, quite irrespective of how the lens diaphragm was marked.

Having had this double list, for copying upon the plates usually employed, as well as for process-plates, neatly typed, it was mounted on a card which was pinned upon the wall between the dark-room door and the copying camera, so that it could be examined at a glance. A cheap yard-stick was hung beside the camera on the same side so that zero was always above the lens. Obviously the actual extension of the camera could be noted by the figure against which the ground-glass stood. It will now be realised that if the eight-inch lens was in use (with the stop set at *f*/8 as before) the rule would indicate the value of the stop according to the extension in use. That is to say, if the extension registered twenty-two inches, the exposure would be read off on the table against *f*/22, and so on. For other lenses all that was necessary was to set the diaphragm at the figure represented by the focal length of the lens itself to obtain the standard one-inch aperture. For instance, a four-inch lens was used at *f*/4 and a thirteen-inch lens at *f*/13, for which the pointer would be fixed somewhere between *f*/11 and *f*/16.

Similarly for extensions between those representing stop values an exposure between those two upon the list would be given.

If it were necessary to use a smaller actual stop, obviously the exposure would be read off on the list, and this would be doubled for every step down upon the diaphragm, but by employing good lenses of suitable focal lengths this was only required for subjects of exceptionally fine detail and of large area. The only variations that proved necessary were two, and these were not at all under the control of the operator. The first was fluctuation in the strength of the light. After a while it was noted that this occurred usually at specific times of day probably owing to variations of the load at the supply works. If batches of copying were in progress at such times an occasional plate was developed as work progressed to check results. The other trouble was due to the fact that batches of plates of the same make vary in speed. This was overcome by ordering reasonably large supplies, and noting when a new batch came into use and then developing one or two before proceeding. If a decisive alteration in exposures was required a bit of paper would be gummed upon the exposure table with the alteration pencilled upon it, for instance, "+ 25 per cent" meaning, add 25 per cent. to all exposures.

By thus standardising all possible factors, and by reducing practically all the others to a matter of tabulated procedure, it became possible to entrust a junior with large batches of quite difficult copying, including even the production of brilliant line prints from many-coloured originals upon tinted papers and that at the shortest of notice. On the rare occasions that a negative made by this method fell short of the very high standard set, it was seldom so much out that it could not be saved by the ordinary methods of reduction or intensification or by printing upon a suitable paper. Hence it would be quite within the facts to claim for this system a 99 per cent. efficiency. At the same time, it must be pointed out that it is little use adopting one part of the system without the rest. If the distance of the lamps from the easel, or the make of plate or one of the many other factors is frequently altered, any attempt at semi-automatic methods must necessarily fall to the ground.

D. CHARLES.

DALLMEYER CINEMATOGRAPH LENSES.—A new price list just issued by Messrs. J. H. Dallmeyer, Ltd., 11d, Regent Street, London, S.W.1, is a complete catalogue of the various series of lenses designed by the firm for cinematograph cameras and projectors, including condenser lenses for the latter. The series include those of the extreme aperture of *f*/1.9 and also the "Dallon" telephotos. The list is sent free on request.

AUTOTYPE *MEZZOTYPE*.—The Autotype Co., 74, New Oxford Street, London, W.C.1, send us a specimen of a new style of print which they are now offering to professional photographers. The "Mezzotype," as it is called, is a carbon print of cool brown colour, produced upon a very thin transfer paper, which is attached by one edge only to a flexible white mount. The portrait is printed with a soft margin and is provided with a thin cut-out mount bearing an indented line around the aperture. The combination of the rich tones of the carbon print and the added luminosity which the portrait contains through its loose attachment to the supporting mount yields an effect which is highly distinctive, and is one which, we are sure, will recommend itself to photographers who cater for a cultivated class of customer. Mezzotypes are supplied mounted complete at 20s. per dozen in half-plate size; 30s. per dozen in whole plate.

THE MODERN CHEMISTRY OF GELATINE.

[In a recent communication from the Eastman Research Laboratory Dr. S. E. Sheppard reviews some of the most recent work which has been done in the complex problems which concern the part played by the gelatine in the making and use of gelatine dry-plate emulsions. These include the effect of impurities in the gelatine which reduce sensitiveness; viscosity and setting point of gelatine solutions; mechanical strength of jellies and their capacity for swelling; and the behaviour of gelatine in hardening fixing baths and on drying. The paper is being published in the United States in the "Journal of Industrial Engineering Chemistry."]

(*Concluded from page* 697.)

It is not possible here to deal with the data obtained in relation to photographic development. Certain obvious deductions from the data given are, however, of interest. First it will be seen that gelatine films (and emulsions) tend to assume, if not an equilibrium, at least a stationary value, fairly rapidly. In solutions of alkaline carbonates and sulphites, although alkaline, the swelling is less, for concentrations above 5 per cent., than in water, and this depressing effect increases rapidly with the concentration of the salt. This effect is taken advantage of in preparing developing solutions for use at high temperatures, as in the tropics. It may be further noticed that the maximum swelling developed with gelatine on rigid supports tends to be considerably less than that obtained, at the same temperature and p_H with gelatine not attached to a rigid support. In the latter case there is some (though not always a large) dilation in all directions, whereas the photographic layer can only swell normally to the support. If by any means[16] the swelling is forced beyond the limit compatible with this normal swelling, so that the tangential swelling pressure comes into play, two things may happen. The gelatine may frill, and float off the support, or reticulation may occur. This is the production of a network pattern over the film, which spoils the appearance, particularly since the silver particles of the image concentrate in the ridges. Such reticulation is particularly marked after treatment of gelatine with a tanning agent, followed by warm water.

Fixation.

The use of an *acid* fixing bath, primarily to keep down developer stain, involves, as already stated, passage of the gelatine through

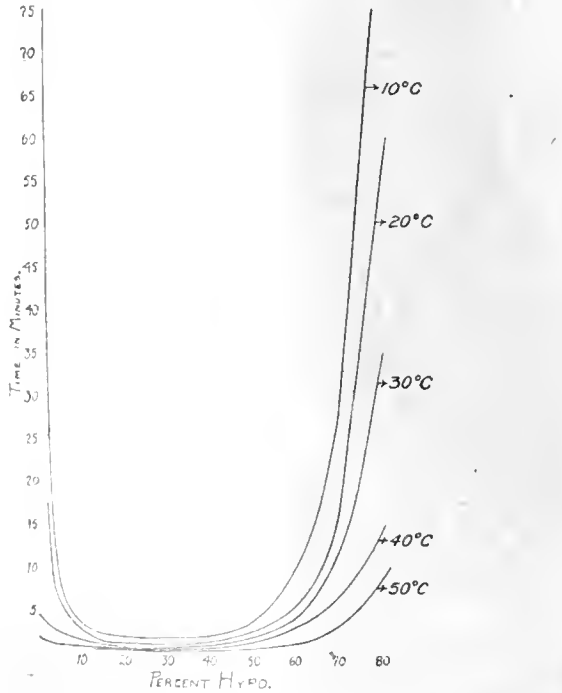


Fig. 11.—Influence of hypo concentration on time of fixation.

the iso electric point of minimum swelling ($p_H = 4.8$). Evidently, if the acidity were considerable, so that p_H approached 3—2, the swelling pressure might increase sufficiently to cause trouble. Actually, however, the p_H of a fixing bath, containing hypo and sulphite, cannot be much less than 4, or otherwise sulphur would be precipitated. The influence of the swelling factor on the rate of fixation (solution of silver bromide in hypo solution) is brought out in fig. 11 and fig. 12. The time of fixation is a minimum for a concentration of thiosulphate of about 40 per

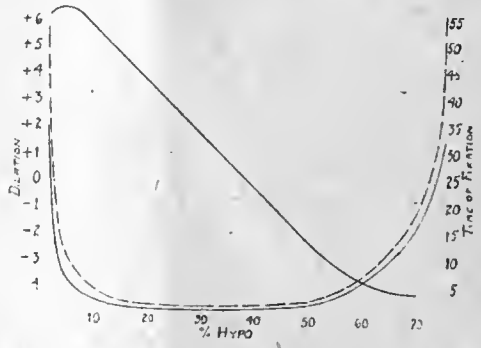


Fig. 12.—Influence of swelling on time of fixation.

cent., above which it again increases. This is due to the fact that from this point on the reduction of swelling more than compensates for "mass action."

The relatively anti-swelling, or temporary hardening effect of the acid fixing bath is generally reinforced by the addition of true hardening (tanning) agents, such as potash alum, chrome alum, or formaline. The hardening action of alums is of great importance photographically, and the writer and his collaborators

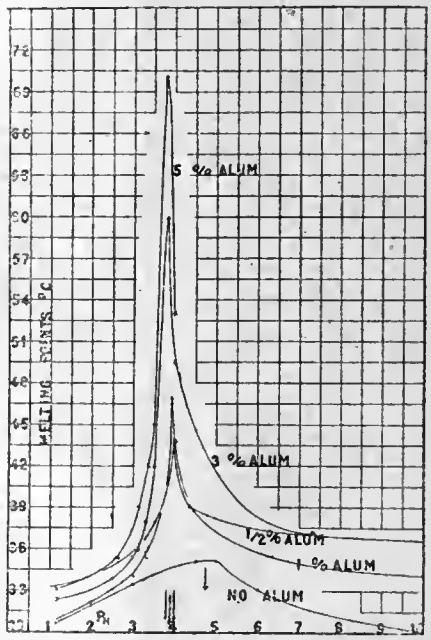


Fig. 13.—Influence of p_H on alum hardening of gelatine.

are making an extended study of the physico-chemical conditions. The influence of the H-ion activity (measured with a hydrogen electrode) on the hardening action of a solution of potash alum [$K_2SO_4.Al_2(SO_4)_3.24H_2O$] is shown in fig. 13.

16. cf. S. E. Sheppard and F. A. Elliott, "The Reticulation of Gelatine." "J. Ind. Eng. Chem.," *10*, 727 (1918).

The "melting points," given as ordinates of the curve, were not determined in the manner given previously, but directly in water, in which the jelly was immersed after it had been soaked a given time in the hardening bath. This corresponds to the conditions in photographic practice. It will be seen that all the solutions give a maximum at the same p_H, about 4.0; this was not changed by altering the p_H of the gelatine, by previous immersion in acid or alkaline solutions. In absence of alum, the maximum occurs at a p_H of 4.7 to 4.8, so that the displacement by the Al seems definite. From J. Loeb's work on the influence of cations, and specifically of $Al^{\cdots}$ [17] on the properties of gelatine, it would seem we should anticipate the maximum hardening at a p_H > 4.7, since for p_H > 4.7 gelatine combines only with cations, for p_H < 4.7, only with anions.

A consideration of the state of aluminium itself in relation to H-ion activity is necessary here, however. This is roughly indicated by the diagram:

Gelatine Combines with Anions.		Gelatine Combines with Cations.
p_H 3		7
	4.7	
Aluminium as $Al^{\cdots}$	$Al(OH)_3$	Aluminium as AlO_2^-

Aluminium commences to precipitate, as hydrous alumina, at $p_H = 3$; precipitation is complete at $p_H = 7$, beyond which alumina

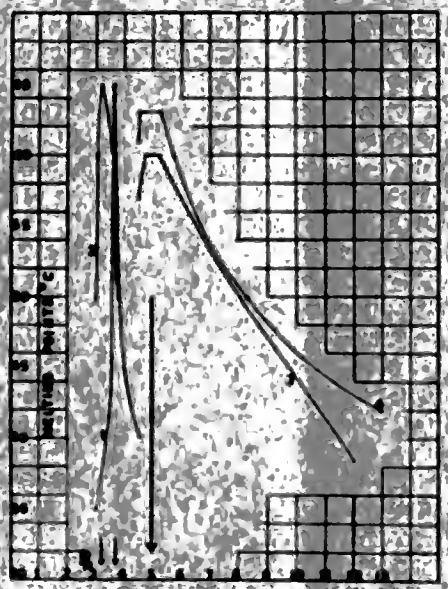


Fig. 14.—(1) 3 per cent. alum, 0.5 per cent. citric acid, 1 per cent. sulphite; (2) as (1) but 2 per cent. sulphite; (3) as (1) but with addition of 25 per cent. hypo.; (4) as (2) but with addition of 25 per cent. hypo.

goes into solution as aluminates. Between $p_H = 3$ and $p_H = 7$ there probably exist complexes, of the type $Al^{\cdots}$ $[Al(O_2)]_x$, which are positively charged, and could combine with a negatively charged gelatine ion.[18] The present results definitely point, however, to combination of Al with gelatine at p_H < 4.7, and it appears possible that this is a mean value, and that some gelatine capable of combination with cations exists for p_H < 4.7. We do, however, find that the addition of sodium sulphite and sodium thiosulphate, as used in making an acid fixing and hardening bath, displaces the p_H of maximum hardening to values > 4.7. This is possibly due to stabilisation of the positively charged Al complexes, and is under investigation. Another interesting point in this connection is this. In an acid fixing bath p_H cannot be much less than 4, otherwise *sulphur* will be precipitated from $Na_2S_2O_3$. Yet, if p_H is > 4, alumina will tend to precipitate and the bath become useless. This impasse is overcome by using, as the acidifier such organic acids as citric, tartaric, etc., which form complexes with aluminium and prevent precipitation by hydroxyl ions. This complex formation lowers the hardening action as shown in fig. 15, since the complex formation

17. "J. Gen. Physiolog." I., 663 (1919).
18. The formation of complex aluminium anions may commence earlier.

removes the $Al^{\cdots}$ ions, and it is necessary to increase the alum content to secure effective hardening. Loeb [19] has suggested that the antagonistic effect of citric acid on the combination of gelatine with aluminium is due to its being tribasic, neutralising a trivalent cation. This is not the case. The antagonistic action

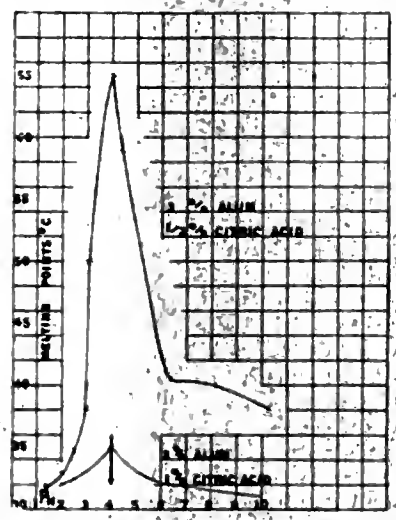


Fig. 15.—Influence of citric acid on hardening of gelatine by alum.

is due to the complex formation, and is shown by other monobasic and dibasic organic acids, but particularly by hydroxy acids. The hardening action of chromium salts is governed by similar conditions, with certain singularities under investigation, and the behaviour of bichromated gelatine is closely connected with these tanning reactions.

It is now in order to note briefly the operations of *washing* and *drying* gelatine plates and films. Washing out substances, such as hypo, etc., from gelatine follows in general the law regulating the washing of precipitates. Two things may, however, be noted. On washing out strong electrolytes from gelatine, it will tend to approach the iso-electric point, but if hydrolyzable substances are present the gelatine will retain unequal amounts of the basic or acidic constituents, the excess depending upon conditions.

It has been impossible, in the space at my disposal, to discuss the many important, if incidental, roles played by gelatine in deviations from or developments of the straight process of negative

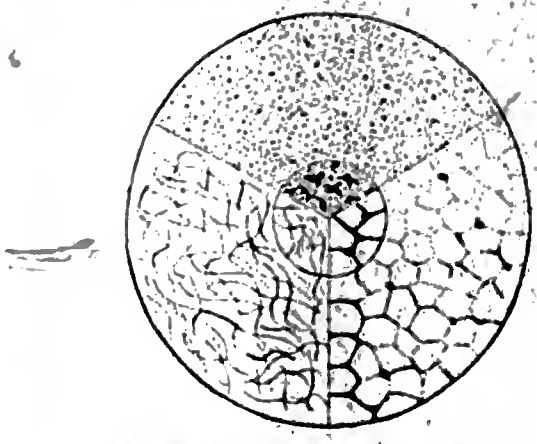


Fig. 16.—Suggested structures of gelatine jellies.

making. Such are: the incidence of hydrolysis and oxidation of the gelatine in photographic operations, its capacity for absorption and fixation of dyes, and many others. Again, the simple operation of drying shows interesting features, one only of which may be mentioned, as bearing upon the so-called "structure" of gelatine jellies. Fig. 16 illustrates three typical structures

19. "J. Gen. Physiolog." I., 504 (1919).

suggested—viz., the "honeycomb" or alveolar, the filamentous, fibrillar or "felt" structure, and the "granular" structure. Appeal is made to these, variously, to explain certain properties of jellies.[20] In particular, the honeycomb or cell structure has been cited in explanation of the effects of the concentration at setting on the swelling of dried jellies. A jelly at 5 per cent. concentration on drying and reswelling again halts at 5 per cent., a 10 per cent., one at 10 per cent., etc. It has been suggested that in the more dilute jellies a more open structure of larger cells is formed. In a recent paper the writer and F. A. Elliott[21] have explained this as a result of external case hardening. Under ordinary drying conditions a non-uniform drying forms a permanently set skin, conserving the original surface extension of the piece of jelly, and this limits the subsequent dilation on swelling. An internal "structure" is therefore an unnecessary hypothesis for the explanation of the concentration effect.

S. E. Sheppard.

20. cf. Physics and Chemistry of Colloids. Report of General Discussion by the Faraday Society and the Physical Society. London. pp. 40-54. (Department of Science and Industrial Research, Great Britain.)

21. "J. Amer. Chem. Soc.," 44, 383 (1922). Dr. T. Slater Price, Director of the British Photographic Research Association, has called the writer's attention to previous notice of the edge drying of gelatine jellies by R. Liesegang. Koll. Zeitschr. 7, 305 (1910); Liesegang, however, does not seem to have related this to the concentration effect.

DISPLAYS THE PHOTOGRAPHIC STUDIO CAN ARRANGE.

More might be done by the studio photographer in making use of his window and showcase display facilities. It is true, of course, that he seldom has the same amount of space at his disposal as the average shop, but his limited scope for display permits of more things being done in this connection than he sometimes realises.

Better than all the theories under the sun are the following examples of how American studio photographers have made attractive and unusual displays in spite of the obvious handicaps they have had to contend with.

Rensler's, Cleveland, Ohio, U.S.A., devoted a display to the babies. The central feature of the window was a large baby doll, dressed entirely in white, who caused the women folk to ejaculate: "Isn't she a darling?" A card placed right behind the baby doll suggested:

"BRING THE BABIES.
Special Care Taken. To-morrow May Be Too Late."

Photographs of babies taken by this studio, and mounted in all sorts of ways, were exhibited on the rear and side walls as well as being spread on the window-floor.

The Balser Studio, Buffalo, N.Y., devoted one of their outside showcases to juvenile photographs, backed up by the following sign:

"CHILDREN'S DAY EVERY MONDAY,
Sittings and one picture absolutely free. Ask us."

The free sitting "bait" may not prove acceptable to some studio photographers, but anyway the Children's Day idea is capable of more widespread adoption. It is hard to handle all appointments for sittings on time when there is a child sandwiched in between sittings for adults, for you never know how children are going to act and how long it will take to get them in the right pose for photographing. The Children's Day prevents grown-ups from being disgruntled in waiting unnecessarily long in the reception room.

Another attractive showcase by the Balser Studio, Buffalo, N.Y., contained only photographs of bridal parties, along with the convincing appeal as below:

"MAKE MEMORIES LAST.
Special Prices to Bridal Parties."

The Allison Studio, 1,210 Market Street, Philadelphia, Pa., worked out quite a novel idea in persuading folk to have their pictures taken. The way in which this was carried out in the outside showcase was by a large picture of Mr. Allison, his face wreathed in smiles, about to photograph somebody in his studio. This picture was appropriately captioned:

"THE PHOTOGRAPHER IS READY TO MAKE YOUR PORTRAIT.
Now is the Time. This is the Place."

Two interesting window displays were recently arranged by Edmonston, Washington, D.C. Appropriately enough, the first display exhibited individual portraits of President and Mrs. Harding and Vice-President Coolidge. There was also an unconventional picture showing Harding and Coolidge together. All these subjects, needless to say, were taken by Edmonston. The portraits were banked against the green cloth background, while on the floor was a display of conservative gilt picture frames, along with a card bearing the following suggestion:—

"Ask to see the frame we have made especially for your photograph."

Grouped at the right of the second Edmonston display was a collection of baby pictures, while grouped at the left were pictures of Civil War days. Modern enlargements of both kinds of subjects formed the convincing exhibit at the middle of the display.

An unusual idea was admirably worked out in a window display by the Bates Studio, Norfolk, Neb. The subject of the window was "The Adventures of a Boy Scout." The pictures forming the various adventures were arranged in logical order in a long picture frame, each adventure being appropriately captioned. The top picture showed the two-year-old son, wearing miniature scout uniform, of a local scoutmaster. Scene two showed the boy parting from his parents at the porch of their home. Other incidents depicted the boy tired after a tramp; building a camp fire; warming himself before the fire; getting homesick; his decision to return home; in the bosom of his home again. Such human interest photographs attracted a great deal of attention while on display, and, no doubt, influenced fond parents to possess permanent records of fleeting boyhood.

Rainy weather need prove no bugbear to the photographer suitably equipped, who does not hesitate to advertise the fact. A rainy week inspired Fred. Hartsook, 285, South First Street, San Jose, Calif., to run an appropriate advertisement beneath the weather forecast in one of the local dailies. The piece of copy was in this vein:—

"Rain and cloudy weather no longer interfere with the making of photographs. Thousands of up-to-date photographers have closed up their skylights, securing superior and more uniform results with artificial light in the posing room. Our studios are all equipped with the latest in operating lights."

The "ad." was set in ordinary reading matter type, of exactly the same kind as that used for the weather forecast, with the word "Advertisement," in order to conform with the postal regulations, printed in small black type. Such an advertisement could be made doubly effective by tying it up with a window or showcase display. A barometer might be placed in the middle of the display of photographs, along with a sign something like this:—

"The Barometer predicts more rain.
But this need not cause you to put off having your portrait made, for our artificially-lighted studio is equal to the best daylight results."

Here is an excellent piece of newspaper copy, run by Oakley's Photographic Studio, Albury, N.S.W., Australia, devoted to baby:—

"THE BABY
you cuddle in your arms to-day will be going to school to-morrow, and the flight of time brings many changes.

A photograph of baby NOW may mean the avoidance of disappointment later.

We LIKE Babies and know how to treat Their Highnesses to get good portraits."

Excellent propaganda, is it not? and is the sort of copy to make mothers stop, pause and ponder.

Ernest A. Dench.

Assistants' Notes.

Notes by and for assistants will be considered for this column. Payment for accepted contributions is made on the first of the month following publication.

The Workman and His Tools.

Although the old saw does not specifically state that a complaint against his tools is evidence of a bad workman, so closely related are the two ideas, by ancient habit, that many a clever worker hesitates to bring upon himself the implied odium, and "carries on" with the apparatus supplied him.

Many a camera has earned its owner many guineas, and, for that reason is cherished as a valuable instrument, though it were better pensioned off. I watched an operator the other day photographing objects of fabulous worth in a world-famed institution. His camera was a square-bellows, for rigidity, of course. But, alas, as he focussed the back wobbled visibly. So it did as he inserted the dark-slide. The latter he furtively carried from the case to the camera under his coat. Most of the slides leaked, he told me, if the greatest care was not taken. He had to stop down more than really necessary, because the looseness of the fittings might throw the picture out of focus.

All that operator's energies seemed to be occupied in overcoming the decrepitude of his apparatus instead of in studying his subject. I feel certain the time he must waste in a year through no fault of his own would pay for a new outfit. (Did I mention that he stuck a pointed match in somewhere to prevent something slipping?)

Last week I was an unwilling guest at a wedding, and for once the inevitable group claimed me as a fellow victim. The result was astonishingly good. Astonishing to me because the poor operator was apparently troubled at every critical moment by something in the apparatus that caused him very evident anxiety.

Seeing that there were *two* of the usual funny men, and a couple of babies and a dog as well, and every minute it threatened to rain, the poor chap's patience was a thing to marvel at. With the best apparatus his would have been no job to envy, but with the obviously rickety old thing he so carefully kept as much as possible under the focussing-cloth it was wonderful that he succeeded so well.

Let your operators have the best you can afford. Second rate gear may work well under favourable conditions, but in the stress of modern business life such conditions seldom occur. The less a photographer has to worry about his handicaps, the more attention he can give to getting his subject to advantage.—Kinton.

Painting Sheet Zinc.—Sheet zinc has many uses in the studio and workroom, and many workers have tried to paint it without success, the surface of zinc, both new and old, not taking kindly to paints and varnishes. The way to treat zinc is as follows:—Take 1 oz. of chloride of copper; 1 oz. of nitrate of copper; 1 oz. of sal ammoniac, and dissolve the three in 3 pints of water; when quite dissolved add 1 oz. of commercial hydrochloric acid. The zinc is brushed over thoroughly with this solution, which turns the zinc a dull black colour, and takes twelve or more hours to dry. When quite dry paint or varnish may be applied in the usual way, the treated surface taking and holding the applied coatings of pigments and varnish very well.—L. T. W.

A Studio Fire Extinguisher.—Accidents will happen, even in the best regulated studios, and fire is one of the most terrifying mishaps. When working in a studio in which a considerable amount of flashlight and magnesium wire was used, extra precautions were called for in the shape of glass bottles of a fire-extinguishing fluid, the latter being made by simply dissolving 2 lbs. of common salt and 1 lb. of sal ammoniac in 5½ pints of water. This mixture was placed in empty pyro bottles, which were afterwards tightly corked and given dabs of red paint. Happily the extinguishers were never called for, but experiments carried out in a back-yard proved the solution to be effective.—L. T. W.

Houghtons' Professional Bulletin for November contains an illustrated interview with Mr. Alexander Corbett, the new president of the P.P.A., photographs of the recent P.P.A. Congress, and notices of some new goods, among them the "Stipwell" mechanical retoucher.

Exhibitions.

PORTRAITURE BY MR. LUBOSHEY AT THE CAMERA CLUB.

When Mr. Solomon J. Solomon, President of the Royal Society of British Artists, opened the annual exhibition of the Royal Photographic Society last September, his eye was caught by a portrait of Sir Henry Trueman Wood, which he declared to be an astonishing piece of work. He said that, although in monochrome, the portrait gave him a vivid suggestion of colour and texture of flesh and hair.

One is glad to see this distinguished portrait again, one of forty or more, at the London Camera Club, in John Street, Adelphi, all of them the work of Mr. N. E. Luboshey, who is exhibiting there during the month of November. The subjects include some eminent people whom everybody knows, and others who are known only to a small circle. There are faces familiar to those who visit the haunts of pictorial photographers in London, and there are others who are known to the country at large through their appearance on the political platform or in the illustrated Press. There are people whom you might meet in the Adelphi or in Fleet Street, and others whom you would have to travel to Stockholm or Copenhagen to see. There are wrinkled old men with bushy beards in this collection, and alert, young-looking men in the full tide of their days. There are men of thought and men of affairs. One feels that Mr. Luboshey has been fortunate in his subjects, ranging as they do from Leo Tolstoy to one at least of the choice spirits of the Croydon Camera Club. All of them are interesting men.

But if Mr. Luboshey has been fortunate in his subjects, his subjects have been even more fortunate in Mr. Luboshey. The men who figure in this portrait gallery are evidently very diverse in temperament and gifts. It is not so much an exhibition of portraits of distinguished men as an exhibition of distinguished portraits. These are portraits of quality, alike in the personal and the photographic sense. You begin the round of the exhibition by trying to analyse the characters presented to you, but before you have done you begin to ask some questions about the man who presents them.

Mr. Luboshey's methods in portraiture are well known, or ought to be. He has expounded them as plainly and painstakingly and picturesquely as possible. If they are not followed widely in photographic portraiture to-day it is not because they are difficult to acquire, but because they are easy. Mr. Luboshey preaches that simple gospel which is above all things difficult to accept. Had he started a school of photographers who lighted their sitters from behind their heads or from underneath their feet, he would have had a crowd of disciples. But when he stands out for straight front lighting from one source—in fact, for the lighting of his sitters as nature herself lights the world—others exclaim that there is no art in doing that. Of all false antitheses, the falsest is that art and nature are opposites. But many think that the acceptance of the ordinary and obvious way of going to work does not give sufficient scope to their own individuality, and so they go in for some eccentric lighting, from behind or from the side, which, combined perhaps with a strained pose and with various methods of control in printing, gives us what might be a picture of trellis work, but is scarcely recognisable as the human countenance.

One turns with relief to such an exhibition as Mr. Luboshey's, for it is unsophisticated, unaffected, simple, direct. The photographer himself is not interposing his own personality. He knows his place; he stands back from his sitters, instead of always putting himself in front of them. He is content that they should speak for themselves. Even in the groups, of which there are one or two examples, there is no great elaborateness of arrangement. Mr. Luboshey has faith in the inherent rightness of the natural scheme of things.

There are some other points to be noted. One is the deft use of collar or cuff or handkerchief (or, in the case of Tolstoy, the light smock) to carry a higher light than the face, and yet to be a foil which makes the face more interesting, for the face is alive and historic, while the other is a bit of inert linen. Another thing is the lighting which he manages to get into his shadows by having his front light at various distances and intensities. The face—and the whole face—is the chief interest, and if anything else comes in at all it is only to assist this main theme. It is rarely that he introduces an accessory. One in-

stance is a microscope, introduced into the portrait of Dr. Rodman, Past President of the Royal Photographic Society, but Mr. Luboshey had to resort to combination printing to get this result, because he found that to include the sitter and the microscope in the one exposure meant that the sitter suffered to some extent from the distraction of a competing interest. The dark ground is almost unbroken in all these portraits. The face appears out of the living blackness or greyness to tell its own unaided story.

These portraits are the work of a man who combines shrewd observation with brotherly sympathy. They are full of character. The people are presented just as they are in real life, with all their whims and foibles, their patience and generosity. There is no smudging or loss of definition, nothing hidden that should have been revealed. One feels that they are men whom it would be good to know—the clubman with his cigar, the editor beaming (or otherwise) through his glasses, the scientist with his implements—but, all the same, one feels that, if it could be managed, it would be a good thing to have Mr. Luboshey there to do the introductions.

H. C.

FORTHCOMING EXHIBITIONS.

December 9 to 31.—Rochdale Amateur Photographic Society. Particulars from the Hon. Secretary, W. Lord, 10, Derwent Street, Rochdale.

1923.

February 5 to March 3.—Northern Photographic Exhibition, City Art Gallery, Manchester. Latest date for entries, January 12. Particulars from the Hon. Exhibition Secretary, Walter Johnson, 30, Hartington Road, Chorlton-cum-Hardy, Manchester.

March 1 to 8.—Birmingham Photographic Society. Latest date for entries, February 15. Particulars from the Hon. Secretary, J. E. Brecze, 178, Broad Street, Birmingham.

March 2 to 31.—Pittsburgh Salon of Photography. Latest date, February 5. Secretary, Charles K. Archer, 1,412, Carnegie Building, Pittsburgh, Pa., U.S.A.

March 13 to 16.—Exeter and West of England Photographic Exhibition. Particulars from the Hon. Secretary, R. W. J. Norton, 4, Buddle Park, St. Thomas, Exeter.

March 15 to 24.—Photographic Fair, Holland Park Hall, Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications November 6 to 11.

ENLARGING.—No. 30,424. Photographic enlarging apparatus. W. E. O'Reilly (W. Holden).

FLASHLIGHT.—No. 30,241. Photographic flashlight apparatus. H. Lamplough.

PHOTOGRAPHY.—No. 30,659. Photography. J. S. Lauder.

PRINTING FRAME.—No. 30,428. Photographic printing frame. D. H. O'Neill.

APPARATUS.—No. 30,710. Film treating apparatus. Werkstätte für Feinmechanik Ges.

FILMS.—No. 30,451. Light-sensitive film or layer. Kalle and Co., Akt. Ges.

FILMS.—No. 30,841. Treatment of photographic films. Counsell Film Process and Chemical Co., Ltd.

CINEMATOGRAPHY.—No. 30,449. Cinematograph films. L. G. Egrot

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

F/2 ANASTIGMATS.—No. 187,082 (Aug. 22, 1921).—The invention provides for the correction of all aberrations in a photographic objective; in introducing a correction for positive spherical aberration by an air space having the form of a positive lens; the production of an objective with a negative lens of such formation and in such relation to the other lenses that the telephoto effect is attained; and the production of an objective which will be satisfactory in exceptional cases where the light is uncertain or insufficient. In all the drawings the two forward lenses L^1 and L^2 are of axial thickness d^1 and d^2 respectively, have the radii r^1, r^2, r^3 and r^4 respectively, and are separated by an air space b^1. The third lens L^3 is of axial thickness d^3 and the radii of curvature are r^5 and r^6. The space b^2 separates the lenses L^3 and L^2 and the space b^3 separates the lens L^3 from the lens L^4 which is of axial thickness d^4 and with radii of curvature r^7 and r^8. In figs. 3 and 4 the lens L^4 is replaced by a doublet of lenses. In fig. 3 the doublet lenses $L^{4\,1}$ and $L^{4\,11}$ are of axial thickness $d^{4\,1}$ and $d^{4\,11}$ and with radii of curvature r^7 and r^8, respectively, and with a common radius r^9. In fig. 4 the doublet lenses L^{4a} and L^{4b} are of axial thickness d^{4a} and d^{4b} and with radii of curvature r^7 and r^8 respectively, and with a common radius r^{9a}. The two forward lenses L^1 and L^2 are of strong positive focus and of relatively low dispersive power, being preferably of crown glass. They are placed in the combination with their convex surfaces facing the incident rays. The third or negative lens L^3 of the combination is of double concave form and of relatively high dispersive and high refractive power, being preferably of dense flint glass. The fourth lens L^4, which may be of crown glass, is of positive focus and of relatively low dispersive power. The radius of curvature (r^6) of the posterior surface of lens L^3 is the shortest of any lens surface of the system.

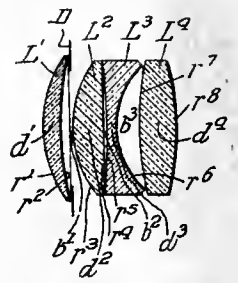


Fig. 1.

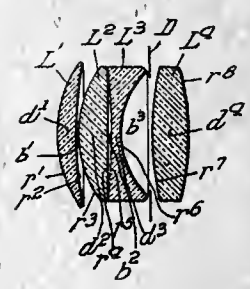


Fig. 2.

The combination of the three lenses L^1, L^2 and L^3 in itself produces the telephoto effect. This condition results in the optical centre of the system being nearer the incident rays than in the ordinary system where it is about in the middle of the system. Since their compnted combined focal length is greater than the amount of racking out ascertained by trial, the actual focus of the lens system is relatively close to the rear lens of the system. The lenses L^2 and L^3 constitute an uncemented doublet, these lenses being formed so that their facing surfaces shall have slightly differing radii. This formation, in conjunction with the other properties of the three lenses L^1, L^2 and L^3, corrects the positive spherical aberration, or may even create a slight amount of negative spherical aberration.

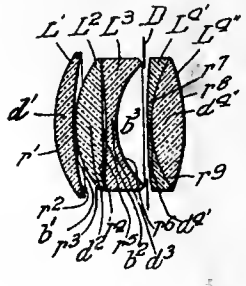


Fig. 3.

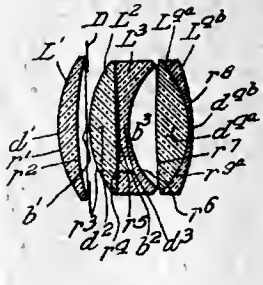


Fig. 4.

Recent photographic experience has shown that high apertures with as much depth of field as is possible is the most desirable condition. Although the three lenses L^1, L^2 and L^3 may be corrected in themselves so as to form a lens system of fair optical performance, the system would be only of a relatively moderate aperture. The addition of the fourth lens L^4, however, produces a lens system corrected to a very much larger aperture. The four lenses shown in figs. 1 and 2 provide sufficient correction for very acceptable

optical performance, but for the further correction of possible outstanding errors, the modified objective shown in figs. 3 and 4 may be used. The lens L^1 is replaced by a cemented doublet of two lenses $L^{1\,1}$ and $L^{1\,11}$ or L^{1a} and L^{1b} of different refractive powers. These latter combinations provide corrective power for neutralising any possible outstanding errors. The diaphragm D may be placed at any suitable point of the system. Herein we have shown it in two different positions, between the lenses L^1 and L^2 in figs. 1 and 4, between the lenses L^2 and L^3 in Fig. 2, and between the lenses L^3 and L^4 in Fig. 3.

One example of the type of objective shown in fig. 1 is given below:—

Radius in Millimetres.			Thickness of lenses and spaces between lenses in Millimetres.	
r^1	+	37.0	d^1 for lens L^1	4.34
r^2	+	76.0	Space b^1	3.00
r^3	+	31.5	d^2 for lens L^2	6.90
r^4	—	——	Space b^2	1.20
r^5	—	160.0	d^3 for lens L^3	3.20
r^6	+	22.5	Space b^3	6.50
r^7	+	80.0	d^4 for lens L^4	7.24
r^8	—	72.0		

The refractive indices n_C, n_D and n_F relating to the C, D and F lines respectively of the solar spectrum and the dispersion y for the different kinds of glass used in this example are:—

			Lens L^1	Lens L^2	Lens L^3	Lens L^4 (below)
n_C	..	..	1.6088	1.51446	1.61205	1.56967
n_D	..	..	1.6120	1.5170	1.6169	1.5726
n_F	..	..	1.61963	1.52305	1.62896	1.57962
y	..	..	56.6	60.2	36.4	57.4

Focal distance 65mm.; diameter of largest lens 38 mm.; effective aperture .5 or $f/2$; anastigmatically flattened field about 65°.

One example of the type of objective shown in Fig. 2 is given below:—

Radius in Millimetres.			Thickness of lenses and spaces between lenses in Millimetres.	
r^1	+	37.0	d^1 for lens L^1	4.34
r^2	+	76.0	Space b^1	.05
r^3	+	31.5	d^2 for lens L^2	6.90
r^4		∞	Space b^2	1.20
r^5	—	160.0	d^3 for lens L^3	3.20
r^6	+	22.5	Space b^3	10.00
r^7	+	80.0	d^4 for lens L^4	7.24
r^8	—	72.0		

The refractive indices n_C, n_D, and n_F relating to the C, D and F lines respectively of the solar spectrum and the dispersion y for the different kinds of glass used in this example are:—

			Lens L^1	Lens L^2	Lens L^3	Lens L^4
n_C	..	..	1.6088	1.51446	1.61205	1.56967
n_D	..	..	1.6120	1.5170	1.6169	1.5726
n_F	..	..	1.61963	1.52305	1.62896	1.57962
y	..	..	56.6	60.2	36.4	57.4

Focal distance 65 mm.; diameter of largest lens 38 mm.; effective aperture .5 or $f/2$; anastigmatically flattened field about 65°.

One example of the type of objective shown in Fig. 3 is given below:—

Radius in Millimetres.			Thickness of lenses and spaces between lenses in Millimetres.	
r^1	+	32.2	d^1 for lens L^1	5.16
r^2	+	79.0	Space b^1	.05
r^3	+	27.6	d^2 for lens L^2	7.26
r^4		∞	Space b^2	0.90
r^5	—	150.0	d^3 for lens L^3	2.70
r^6	+	22.0	Space b^3	8.00
r^7	+	210.0	$d^{4\,1}$ for lens $L^{4\,1}$	1.15
r^8	—	48.0	$d^{4\,11}$ for lens $L^{4\,11}$	8.40
r^9	+	35.0		

The refractive indices n_C, n_D and n_F and the dispersion y for the different kinds of glass used in this example are:—

			Lens L^1	Lens L^2	Lens L^3	Lens $L^{4\,1}$	Lens $L^{4\,11}$
n_C	..	..	1.5372	1.51446	1.61205	1.56967	1.51446
n_D	..	..	1.5399	1.5170	1.6169	1.5726	1.5170
n_F	..	..	1.54629	1.52305	1.62896	1.57962	1.52305
y	..	..	60.2	60.2	36.4	57.4	60.2

Focal distance, 65 mm.; diameter of largest lens 38 mm.; effective aperture .5 or $f/2$; anastigmatically flattened field about 80°

One example of the type of objective shown in fig. 4 is given below:—

Radius in Millimetres.			Thickness of lenses and spaces between lenses in Millimetres.	
r^1	+	32.0	d^1 for lens L^1	5.16
r^2	+	79.0	Space b^1	3.00
r^3	+	27.6	d^2 for lens L^2	7.26
r^4		∞	Space b^2	0.90
r^5	—	150.0	d^3 for lens L^3	2.70
r^6	—	22.0	Space b^3	7.00
r^7	—	210.0	d^{4a} for lens L^{4a}	8.55
r^8	—	48.0	d^{4b} for lens L^{4b}	1.00
r^9	—	22.5		

The refractive indices n_C, n_D and n_F and the dispersion y for the different kinds of glass used in this example are:—

			Lens L^1	Lens L^2	Lens L^3	Lens L^{4a}	Lens 4^b
n_C	..	..	1.5372	1.51446	1.61205	1.56967	1.51446
n_D	..	..	1.5399	1.5170	1.6169	1.5726	1.5170
n_F	..	..	1.54629	1.52305	1.62896	1.57962	1.52305
y	..	..	60.2	60.2	36.4	57.4	60.2

Focal distance, 65mm.; diameter of largest lens, 38 mm.; effective aperture .5 or $f/2$; anastigmatically flattened field about 80°.

The dispersion values given in the foregoing tables have been calculated from the following formula:—

$$n_D - l$$
$$n_F - n_C = y$$

Charles Clayton Minor, 2336 West Monroe Street, Chicago, and Herman Adolph de Vry, 1274 Marianna Street, Chicago.

Film-Changing Device for Roll-Film Cameras.—No. 169,718 (October 1, 1920). The invention describes a photographic camera in which film spools are used and which is provided with an automatic shutter, the operation of the shutter and the changing of the sensitive surface being interdependent or combined so as to avoid any possibility of a double exposure. A single sliding device acts at first on the lever of the automatic shutter and afterwards drives the spool on which the film is wound. For this purpose the sliding device is rigidly connected to a ratchet wheel with which a pawl carried by an arm on a toothed sector co-operates, the sector engaging with a series of teeth on the sliding operating device. A fork for holding the film in place for exposure is included, consisting of a toothed cross-bar adapted to engage in the perforations of the film and coupled to a lever placed under the control of the sliding operating device in such a way that this latter shall release the film before the spool on which it is wound is set in rotation.—Giuseppe Giovanni Battista Tartara, 47, Via Lagrange, Turin, Italy.

Locking Device for Shutter Triggers.—No. 185,538 (June 17, 1921). The invention provides an automatic locking mechanism for the camera shutter which is so arranged that the shutter trigger and mechanism are automatically locked, and thereby the accidental operation of the exposure blades is prevented. When the semi-circular handle of the film spool or reel is rotated and a new film is brought into position, a projection on the handle releases the locking mechanism and the shutter is free to make another exposure.

The object of the invention is to provide cameras embodying means to prevent two or more exposures being made upon one and the same film by positively locking the shutter operating trigger until the winding handle of the film spool is rotated and a new film is in position behind the lens.—John James Holmes-Higgin and Francis Beckwith Holmes-Higgin, Ford Park, Ulverston, Lancaster.

The following complete specifications are open to public inspection before acceptance:

Colour Cinematography. No. 188,329. Colour cinematographic films and method of making same. Technicolor Motion Picture Corporation.

Trade Names and Marks.

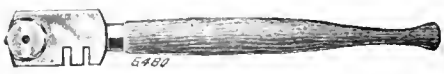
MARKS PLACED ON THE REGISTER.

The following marks have been placed on the register:—

Kodatone.—No. 327,505. All photographic papers. Kodak, Ltd., Kodak House, Kingsway, London, W.C.2, dealers in photographic materials.

New Apparatus.

ENSIGN GLASS CUTTER. Messrs. Houghtons, Ltd., have just placed upon the market a glass cutter consisting of a hardened steel wheel mounted on a metal head, which is provided with two deep notches for breaking off glass of somewhat great thickness.



We have found the little implement most effective for its purpose. It is supplied at the price of 1s. 6d., mounted in a wooden handle, and with six extra cutting wheels. Simply by the use of a small screw-driver a fresh wheel is very quickly placed in position.

New Materials.

Kodatone Collodion Self-Toning Paper. Made by Kodak, Ltd., Kingsway, London, W.C.2.

THIS new collodion self-toning paper has been placed upon the market by the Kodak Co. in two surfaces, matt and glossy, both of single weight and both of the white variety. The papers are printed in precisely the usual way, requiring to be taken to a somewhat greater depth than is desired in the finished prints. The subsequent manipulation consists in first washing the prints in several changes of water, and then fixing in a solution of hypo. 4 ozs. in 30 ozs. of water. This simple treatment yields prints of exceedingly rich and pleasant sepia colour. It should be noted that this result is obtained after thorough washing of the prints. The fact is strongly in the favour of the paper, since it is obvious that the sepia tone is the single result of the materials in the emulsion, and is not in part the outcome of sulphur toning caused by the introduction of acid from the paper into the fixing bath. We have long recommended that choice of a self-toning paper should be made on the strength of its ability to yield good tones even though the prints are well washed before fixing, and we are glad to see that Kodatone comes within this specification. Prints of fine purple brown tone are readily obtained by immersion for five minutes in a weak salt bath, washing in several changes of water, and then fixing in the hypo solution recommended for sepia tones. It is impossible to find fault with the quality of the results most readily obtained on this self-toning paper, which evidently is a material of this kind of the first rank.

Ensign Christmas Mounts and Calendars. Made by Houghtons, Ltd., 88-89, High Holborn, London, W.C.1.

MESSRS. HOUGHTONS' greeting mounts and calendars for the forthcoming season include a series of inexpensive folder slip-in mounts in sizes from vest-pocket to postcard. The mounts are embellished

by attractive cover designs in red and green, and are supplied in sets of six at prices from 1s. 3d. to 1s. 6d. per set. The illustration shows the choice of three designs which is offered.

The calendars are issued in the same series of sizes and in greater variety of style. The series 83 (illustrated) is of the slip-in pattern, of stout dark board covered with a most pleasing white art matt beneath which the print is placed. This style is obtainable in either grey or brown, at prices from 4d. to 7d. each. In

the 83B series, the colours are again either grey or brown and the boards are given a printed border within which the photograph is pasted. The 83A series is also of paste-down pattern and consists of a white flexible hand-made board with deckle edges and plate-mark. A very light and attractive form of greeting calendar. The prices of these two latter series are the same as those of No. 83. In all three series the calendars are supplied only for prints placed "landscape way" on them.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, NOVEMBER 27.

Birmingham Phot. Art Club. "Old Processes and New Methods." W. F. Slater.
Bradford Phot. Soc. Members' Lantern Slide Night.
City of London and Cripplegate P.S. "Amiens Cathedral." E. W. Harvey Piper.
Derby Phot. Soc. "Night Photography." A. H. Blake.
Dewsbury Phot. Soc. "Week-end Cottages in Wensleydale and Wharfedale." G. Thistlethwaite.
Kidderminster and District Phot. Soc. Members' Slides.
Maidstone and District Phot. Soc. "Lantern Slide Making." A. Dordan Pyke.
Southampton Camera Club. "Through the Dolomites to Venice." C. H. E. West.
Willesden Phot. Soc. "Development and Consideration of Negatives." G. C. Weston.

TUESDAY, NOVEMBER 28.

Royal Photographic Society. "Off the Beaten Track at the Zoo." J. E. Saunders.
Birmingham Phot Soc. "The Man behind the Camera and the Making of Portraits." C. P. Crowther.
Bournemouth C.C. Social Evening and Whist Drive.
Cambridge and District Phot. Club. Exhibition of Prints contributed by Scholars of Cambridge Secondary Schools.
Exeter C.C. Exhibition of "Summer Competition" Prints.
Hackney Phot. Soc. Lecture. H. W. Bennett.
Halifax Scientific Society. "Prints and Lantern Slides by the Transferotype Process." W. H. Hammond.
Leeds Phot. Soc. "The Great Masters Interviewed, or a Chat with the Artists of Days Gone By." Rev. W. H. Cooper.
Manchester Amateur Phot. Soc. Whist Drive.
Morley Amateur P.S. "Flower Photography." W. H. Atkinson.
Portsmouth Camera Club. "Through the Dolomites to Venice." C. H. E. West.
Slough and District Y.M.C.A. Phot. Club. "The Making of an Anastigmat Lens." Messrs. Aldis Bros.
South Glasgow C.C. "Callander Outing." R. M'Morrine.

WEDNESDAY, NOVEMBER 29.

Birkenhead Phot. Assoc. "Tramps with a Camera in Holland." T. H. Greenall.
Borough Polytechnic Phot. Soc. "Garden Flowers," A. D. Fort.
Bristol Phot. Club. "Enlarging." E. G. Watts.

Croydon Camera Club. "The Negative and the Bromide Paper." J. M. Sellors.
Forest Hill and Sydenham Phot. Soc. Lantern Slide Making.
Partick Camera Club. "Enlarging." C. E. Daniels.
Rochdale Phot. Soc. A.P. and P., 1922, Prize Slides.
South Suburban and Catford Phot. Socs. "Psychology in the Studio." C. Pollard-Crowther.

THURSDAY, NOVEMBER 30.

Coatbridge Phot. Assoc. Federation Portfolio.
Edge Hill C.C. "Experiences with a 12 in. by 10 in. Camera." W. A. Makinson.
Gateshead and District C.C. "Modern Negative Making." Kodak, Ltd.
Hammersmith Hampshire House P.S. "Quaint Sculptures in England Churches." S. Gardner.
Letchworth Camera Club. "Carbro." C. E. Flemming.
Liverpool A.P. Assoc. "Central Wirral." C. Theodore Green.
North Middlesex P.S. "Working up Enlargement and Prints." Members.
Richmond Camera Club. "Psychic Photography." F. Barlow.
The Camera Club (London). "Biarritz to Carcassonne." Dr. C. Atkin Swan.
Wimbledon and District C.C. "Evils of Faking." R. H. Lawton.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, November 21, Mr. J. Dudley Johnston in the chair.

Mr. Alvin Langdon Coburn made a welcome reappearance, and interested the Pictorial section of the Society with an original discussion upon a subject which is undoubtedly his own. Under the title of "Astrological Portraiture," Mr. Coburn combined the mysteries of the horoscope with every-day work in the studio, and proceeded to classify the classes of sitters, and photographers, who came under the spell of one or other of the twelve signs of the Zodiac. He claimed that by a careful study, which necessitated the knowledge of one's actual date of birth, including the hour and place, of each sitter, and by the making of a horological map it would be possible to get the best pose and expression. Every person, Mr. Coburn solemnly declared, was born under some particular sign, and the characteristics of the section of the Zodiacal circle remained with the individual throughout life. Thus persons born under Aries would possess great energy and force. They would be restless and always endeavouring to improve some particular form of life, while those claimed by Taurus would be quite different. Photographers of this latter state would delight in the photography of gardens and animals, while they would not disdain to portray even the humble bull who was their patron. Gemini claimed persons of wit with brown eyes and restlessness, and photographers were advised to choose their assistants from this class of individual, as they were the best retouchers. The emotional yet homely quality of Cancer's children gave to the portraitist quite an easy going quality. He always had an extremely cosy studio, where cushions and tea were dispensed lavishly, while those of Leo went to the other extreme. The studio of the Leonian was on a large and magnificent scale, gorgeously decorated, and of such imposing grandeur that only a duke would feel at home in it. Virgo was the man for the dark-room. He would carefully catalogue all his negatives, his bottles would be all correctly labelled, and in general appearance his work-room would be spotlessly clean.

To be a successful child photographer it appears necessary to be born under Libra, his qualities reflected in the worker being towards the dispelling of fears. Sitters would be calm and happy immediately they came under the spell of such an operator, and the idea of the dentist's chair would be perfectly dispelled. The lecturer himself belonged to Scorpio, but one failed to notice the facial resemblance which was described by Mr. Coburn. The mystery of photography appealed to this class of people; they did not wish to unravel the chemical and scientific questions, the magic of the whole thing was enough, and they were content. But Sagittarius, of the long type of countenance, was more of a sporty photographer. He favoured the reflex camera, and made his exposures upon horse races and other sports. All press photographers should come under this sign, said the lecturer, if they would be successful. Capricorn was unfortunate. He invariably suffered from rheumatism, and therefore was not keen upon the dark-room work. But he would have a large and well-fitted studio, which would be in a main thoroughfare. His photographs would comprise groups of city companies and luncheons, all of the magnificent and easy kind.

The supporter of all photographic publications was Aquarius, said the lecturer, for he was of the very studious type. He would try all new processes and endeavour to improve old ones. He was keen on invention, and invariably drifted into cinematography. Finally, Pisces claimed the photography of the sea. Marine studies and the smell of tar were associated with this worker, who undoubtedly should be in a section entirely his own.

An interesting discussion followed the lecture, in which many members wished to know their category, but Mr. Coburn said it was not possible to construct a map in so short a time; careful study of the whole subject was first needed. Upon the proposal of Mr. Mellor a hearty vote of thanks was accorded the lecturer for his interesting paper.

CROYDON CAMERA CLUB.

Mr. F. R. Newens, of the Richmond Camera Club, gave a lantern lecture entitled "Rambles with the Paget Colour Plate," pluckily braving a thick and dismal fog and the tortoise velocity of the Brighton line, which of all railways seems the most affected by water-dust particles in the air.

The "office-boy" on drifting in late was welcomed heartily, being accompanied by a bag of loaf-sugar, lemons and a kettle. Mr. Jobling, being aware that rum has a pernicious effect on the liver, with noble self-sacrifice immediately secured the last drop in the only remaining bottle, and received the blessings of all. The betting had reached 10 to 1 against the arrival of the lecturer when he appeared looking as cheerful as a cricket.

Being wishful of reaching home the same evening, by mutual consent all preliminary matter was omitted, and the slides, excellent indeed, only were shown with but brief descriptive comments.

The authority of official instructions bears but lightly on his genial temperament, and he is ever out to experiment in directions deserving of severe official censure. For instance, it is obviously wrong to employ Paget taking and viewing screens in conjunction with Wratten and Ilford panchromatic plates, yet he has obtained very decent results by this fatuous proceeding, accompanied by an appreciable reduction in exposure.

Again, what-properly-brought-up colour-plate worker would dream of using a Sanger-Shepherd graduated yellow filter (x 5 to 0) in front of the orthodox article specially adjusted to the plate? But Mr. Newens often does so. This nefarious practice, he said, secures good skies, clears off a blue veil often present, and vastly improves the rendering of the greens. Other colours, he admitted, frequently suffer a little, but taking a landscape subject as a whole a great improvement may be effected in many cases. It is only fair to record that slide after slide appeared to confirm these statements. A most hearty vote of thanks was accorded him for an evening full of colour.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A meeting of the Council was held at 35, Russell Square, on November 10, 1922. There were present: Messrs. Marcus Adams, Angus Basil, Arthur Bennett, Frank Brown, W. B. Chaplin, Gordon Chase, Alexander Corbett (President), Tom Chidley, C. F. Dickinson, Reginald Haines, George Hana, Herbert Lambert, H. A. St. George, R. N. Speaight (Treasurer), Lang Sims, F. G. Wakefield, H. D. Halksworth Wheeler, together with Mr. Alfred Ellis (Secretary), and Mr. Jenkyn Griffiths. Mr. Alexander Corbett, President, in the chair.

The Secretary stated that, as instructed, he had written the chief constable of Banff, who was the official responsible for the arrangements during the recent royal visit to Elgin, when a complaint was made by a member as to unauthorised press photographers, and the chief constable had replied that no preference was given to any photographers, that no photographers were allowed in the grounds.

Mr. Speaight submitted the balance-sheet of the recent Congress and Exhibition, which he had divided into three separate accounts—an exhibition account (which included the general work of the Congress), an account for the trade section, and an outing's account. He pointed out that certain items which accounted for the adverse balance represented money well spent on behalf of the Association, the benefit of which was already being reaped, and would be further reaped in time to come. The Association had gained 100 new members since January 1, and its status, as a consequence of the Congress and Exhibition, had gone up by leaps and bounds. He wished to place on record his appreciation of the

help given to him by the Secretary in working out the accounts.

On the proposition of Mr. Frank Brown, seconded by Mr. Adams, a vote of thanks was accorded to Mr. Speaight for his work in connection with the accounts.

The following Committees were appointed :—

On the motion of Mr. Chidley, seconded by Mr. Haines, the Finance Committee to consist of Messrs. Chase, St. George, and Wakefield, with the Chairman of Council (and President), Treasurer, and Secretary *ex-officio*.

On the motion of Mr. Brown, seconded by Mr. Basil, the "Record" or Publications Committee to consist of Messrs. Adams, Hana, and Wakefield, with the Chairman of Council, Treasurer and Secretary *ex-officio*.

On the motion of Mr. Chidley, seconded by Mr. Chaplin, the Congress Committee to consist of Messrs. Adams, Basil, Chase, Haines and Wakefield, with the Chairman of Council, Treasurer and Secretary *ex-officio*.

It was also agreed that the convener of each Committee should keep a record of the attendances of the members, and hand such record to the Secretary for inclusion in the Annual Report of Council. It was felt that in the past the bare record of attendance at Council meetings had given an inadequate indication of the labours of the members, many of whom had attended far more Committee meetings than Council meetings, although their attendance at the latter had consumed a large amount of time.

Mr. Basil remarked upon the non-existence of an exhibition committee for other purposes than the Congress exhibition. Hitherto the responsibility of arranging for the representation of the Association at outside exhibitions had fallen upon Mr. Adams. He suggested that a general exhibition committee should be formed, the same to serve as the Congress exhibition committee when the Congress came along.

Mr. Wakefield thereupon proposed, and Mr. St. George seconded, that such an exhibition committee be formed, to consist of Messrs. Adams, Basil, Chase, and Lambert, with the Chairman of Council (and President), Treasurer and Secretary *ex-officio*.

Mr. Adams asked for the necessary authority to put in order the permanent collection of pictures, the property of the Association, and to standardise the sizes of prints to fill, say, four folios, the folios to be purchased at a sum not exceeding £3.

Mr. Adams proposed, and Mr. Brown seconded, that the former should be given this authority, and this was agreed to.

The Secretary read a letter from the Secretary of the Royal Photographic Society stating that a small committee was being appointed to consider a standard size for mounts; that representatives of the Royal Photographic Society and of the London Salon were being selected, and that it was desired to have the co-operation of representatives of the Professional Photographers' Association.

Mr. Speaight proposed, and Mr. Brown seconded, that Mr. Adams and Mr. Basil be appointed representatives on such committee, and this was agreed to. The Council then adjourned after a sitting of four-and-a-quarter hours.

News and Notes.

A Ross-Goerz Lens of 14 inches focus and *f*/7.7 aperture (No. 2,096) has been stolen from Mr. W. M. Crockett, 3, Lyndhurst Road, Devonport. Dealers to whom the lens may be offered are asked to communicate with him.

Mr. T. W. Higginson, for many years in business at Clapton as a trade enlarger and maker of celluloid tinted miniatures, announces his change of address to Cintra, Springfield Road, Sunbury-on-Thames, where the production of these specialties will be continued.

Short-Ray Lenses.—We have to thank the cinematograph trade for yet another new term, namely, "short-ray" pictures. The newspapers of last week stated that an expert audience examined the new short-ray for pictures showing at the Stoll Kingsway Theatre. The old projection gave a throw of 186 ft. from the top of the roof down the big building to the screen. Now several of the boxes in the tier have been sacrificed to the construction of a new projection box. This gives a practically straight throw of 83 ft.

Another "Lightning Photograph."—A remarkable instance of what appears to be a "lightning photograph" in a branch of a beech tree has just been presented to the Royal Botanic Society. The tree was struck by lightning at Mickleham, and there is a clear imprint in a section of the branch of the ivy growing round the tree. In the notices about this curiosity that have appeared in the Press, mention has, of course, been made of images found on the skins of people struck by lightning, but it is rightly pointed out in some papers that neither the image upon the tree nor the images upon the skin are examples of real photography, but markings caused by heat.

Kodak Staff Photographic Society.—Founded early in 1921, this society consisting entirely of members of the staff of Kodak, Ltd., and allied companies, now numbers 400 members. The second annual exhibition was held on Thursday, November 16, in the Lecture Hall, Kingsway Hall, and over 600 prints and many lantern slides were on view. The Society encourages the beginner as well as the advanced worker, and judging by the excellent quality of the work shown much success has been attained. Pictures by members of the staff in many parts of the world, including France, Spain, Italy, Denmark, India, South Africa, Australia, and Singapore were exhibited, while the head office and London branches were well represented. Harrow and the provinces also showed some good work, two prints in this section gaining medals. Mr. W. L. F. Wastell, who judged the exhibits, must have experienced considerable difficulty in making his awards, there being such a wealth of good work. The Society, together with its able and active secretary, Mr. J. M. Hoffmeister, must be congratulated upon getting together such an excellent exhibition.

Houghton's Mounts and Albums.—A most excellent illustrated catalogue of their many styles of mounts and albums has just been issued by Messrs. Houghtons, Ltd., 88-89, High Holborn, London, W.C.1. It is a book of 88 pages, printed in conveniently large type on paper which does ample justice to the many half-tone illustrations of the goods. A classified index shows the pages on which mounts or albums for particular sizes of photographs are catalogued, whilst a numerical index, at the end of the book, forms a key to the pages on which goods known by the makers' trade number are listed and serves also as a price list. The catalogue describes many varieties of slip-in and paste-down albums, of kinds for both the professional and the amateur, and also a very great range of slip-in and other mounts. Several pages are likewise devoted to art mounting boards and papers and passe-partout requisites. The list is issued for the use of photographic dealers, no one of whom can fairly claim to be acquainted with the goods for his customers unless this catalogue is upon his shelf.

U.S. Tariff and Photographic Goods.—By the Tariff Act of 1922, which received the sanction of the United States Senate on September 21 last, duties are levied on goods entering the United States, and, in many instances, are increased. A copy of the Act, which is supplied with a most comprehensive index of the goods affected by it, has been issued in this country by the well-known shipping firm of Thomas Meadows and Co., 35, Milk Street, London, E.C. The photographic goods coming within the Act are cameras and parts, chemicals, dry-plates, films and lenses. The duty on photographic cameras and parts, not specially provided for, is 20 per cent. *ad valorem;* photographic dry-plates, 15 per cent.; photographic and moving picture films, sensitised but not exposed or developed, 4-10ths of 1 per cent. per linear ft. of the standard width; photographic film negatives for use in connection with motion pictures, exposed but not developed, 2 cents per linear ft.; exposed and developed, 3 cents per linear ft.; motion-picture film positives, 1 cent. per linear ft. Films or film negatives, either photographic or cinematograph, exposed in a foreign country by an American producer of motion pictures, operating temporarily in such country in the course of production of a picture 60 per cent. or more of which is made in the United States, are to pay a duty of 1 per cent. per linear ft. Photographic chemicals of coal tar origin, 45 per cent. *ad valorem* based upon the American selling price of any similar competitive article manufactured or produced in the United States, and 7 cents per lb. For two years following the passage of the Act the rate of duty shall be 60 instead of 45 per cent. Photographic and projection lenses, opera and field glasses and other optical instruments, 45 per cent. *ad valorem*. Photographs, 25 per cent. *ad valorem*. Photographs imported by authority or for the use of the United States or the Library of Congress are admitted free, as are also photographs for the use of educational, scientific or literary purposes. Photographs which have been printed more than twenty years are also on the free list.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

BACKGROUNDS IN PORTRAITURE.

To the Editors.

Gentlemen,—*Re* the above subject, would you allow me to say a word as one who abominates the fact of being compelled to attach unsuitable backgrounds to sitters through the difficulty of arranging suitable ones even where they exist? It is not by choice or because of lack of sense of the ridiculous that such pictures are perpetrated, but provision is not made for fixing backgrounds or readily changing them, and operators, especially ladies, may be excused for taking the line of least resistance when their employers have not sufficiently interested themselves in a matter which I consider so vital to the maintaining of continued support from a public which is becoming more critical through the use of the amateur's camera.—Yours faithfully,

DRY PLATE.

THE BRITISH LANDSCAPE EXHIBITION.

To the Editors.

Gentlemen,—With reference to your report on the above exhibition, may I state that the reason I am not exhibiting is not due to any lack of sympathy with the object of the exhibition, but to a lack of new work available at the time of sending in, and to pressure of photographic engagements.—Yours faithfully,

BERTRAM COX.

57, Argyle Road, West Ealing, W.13, November 15.

PORTRAITS OF PHOTOGRAPHIC CELEBRITIES.

To the Editors.

Gentlemen,—The publication in last week's "B.J." of a request for a good portrait of the late Mr. Hector Maclean evidences the need of a file of portraits of men whose names are now, or have been, prominent in the photographic world, and I beg to suggest that the now wideawake Royal Photographic Society is the proper body to undertake and store such a collection of portraits. There is now at the R.P.S. a small collection of portraits of workers famous in the early days of the art of photography, and this collection would form a good nucleus.

As "shoemakers' children are the worst shod," so are photographers the worst (or least) photographed, and I remember that when Mr. Traill Taylor died advertisements were inserted in the "B.J." for a good profile portrait from which the Traill Taylor medal might be made. The scarcity of portraits of photographers is, no doubt, due to the fact that few of them consider it worth while to visit a brother photographer in a professional way, and what portraits do exist are generally to be found in the portfolios of friends who made the portraits.

In the days of the R.P.S. exhibitions at the New Gallery, some scores—possibly hundreds—of portraits were taken with the Platinotype Company's lamp, and, if the negatives still exist, the Company must have an interesting and valuable collection. The R.P.S. would, no doubt, be pleased to have these negatives, or at any rate prints from them. Lamp demonstrations are becoming things of the past, and we must look elsewhere for "stray" portraits, and collections will be found in the possession of well known amateur workers.—Yours faithfully,

H. L. H.

OWNERS OF PHOTOGRAPHS WANTED.—The case referred to under this heading in our last week's issue (page 699) was gone into on Thursday in last week, when Gilbert Martin, 32, canvasser, of Carlton Vale, Kilburn, was at Hendon sent to prison for six months for obtaining medals and photographs from relatives of soldiers killed in the war on the pretence that he would frame them. His practice was to obtain a deposit on account of the work which was never carried out. One hundred photographs were found by the police at Martin's house.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

E. MOSAR.—Almost certainly, it is necessary. There is probably copyright in so recent an etching.

R. B.—The Hermagis lens is made by the Etablissements Hermagis, 29, Rue du Louvre, Paris (2).

W. G.—The only advantage is possibly somewhat finer grain. For contrast you would do better with hydroquinone-caustic.

C. B. M.—For the repair of a focal-plane shutter send to Peeling & Van Neck, Ltd., 4-6, Holborn Circus, London, E.C.1.

W. D. C.—The "flashed" opal glass may be obtained from Messrs. James Hetley & Co., 35, Soho Square, London, W.1.

L. H.—The Central Colouring Co., 516, Harrow Road, London, W.9, would, we think, be the most suitable firm for your purpose.

F. C. TURNER.—(1) No objection; it is regularly done. (2) We can only suggest trying another make of liver of sulphur or of printing paper. Better to use a little ammonia.

J. L.—It is a very old process. Prints are made on ordinary P.O.P. or bromide paper, and after the usual fixing and washing bleached completely in solution of bichloride of mercury. Contact of the prints with paper impregnated with hyposulphite of soda then causes the original image to reappear.

REMBRANDT.—You could possibly obtain instruction in Rembrandt lighting from Mr. John H. Gear, 8, Nottingham Terrace, Marylebone Road, London, N.W.1. A booklet, which would perhaps assist you, is No. 137 of the "Photo-Miniature" series, now out of print, but probably obtainable from Messrs. Houghtons, Ltd., 32-39, High Holborn, London, W.C.1, price 1s. 3d.

A. S. G.—We are sorry we have not by us particulars of the publishers of books of reproductions of the Old Masters. There are several series mostly issued, we think, by Edinburgh publishers. You should pay a call to your local bookseller, who almost certainly will have a stock of the series, or will be able to tell you what they are from the reference books of the general publishing trade. If we were you we should pick out Rembrandt, Gainsborough and Reynolds for a start.

H. W.—We think that two metal filament lamps, each of 2,500 c.p., would be just about of sufficient power in the circumstances you name. You should not diffuse the light too much, that is to say, you should use a fairly thin muslin in front of the lamps. If you care to send a floor plan of the studio showing the present position of the glazing, we could perhaps advise you better. Of course, the length of the place, 12 ft. 6 in., is terribly short, and you will find a lot of difficulty in taking full length portraits.

J. B.—On the presumption that the present copyright law in England prevails also in India, which we expect is the fact, the photographs taken by an assistant in your service and in the course of such service are most emphatically your copyright. We do not think that the assistant is entitled to the negatives or to any rights in the photographs. The answer which we have given applies to England, and has applied there for many years, and we have not the slightest doubt that it holds good in any country where copyright exists.

K. S.—Most of the fixative solutions give matt effects upon drying, but we have found ordinary negative varnish thinned with methylated spirit gives a semi-glossy effect. We should not advise you to apply any of these preparations by means of the Aerograph, owing to the fact that the varnish would clog the small orifices. You could use an atomiser, obtainable from all chemists, which would be far more effective and clean. However, we should think your best method would be to steam the

prints, as this not only fixes the crayon work but gives the semi-glossy effect you need.

A. B.—We should think your best method to illuminate the background would be to use a focussing spotlight. This could be placed upon one side of the studio behind the sitter and the light thrown upon the background and then focussed by means of the sliding lamp tray to cover the area you desire. The background could, therefore, be illuminated from either side of the studio and the area of light altered at will. The background could be given a cloudy effect by the aid of graded filters used in the spotlight. The filters could be easily made from old negatives by scraping, or coating with opaque, as required.

A. L.—(1) $10\frac{3}{4}$ in. is quite a sufficient length for average work. For cabinet heads we do not think it is worth while to purchase a 13-in. or 16-in. lens. (3) We don't think there is any advantage, but rather the reverse, in adding metol to a pyro developer for softness. The pyro-metol is a very energetic combination and gives density very quickly. We think you had far better use your present pyro developer with addition of a certain amount of water, say, one-half the bulk of the working developer for trial. (3) The business of Brucciani has been taken over by the Department for the Sale of Casts, Victoria and Albert Museum, South Kensington, London, S.W.7, to whom you should write.

H. B.—Although your studio is small we think you will require more light than that which you suggest. We think lamps Nos. 1 and 2 should be of 2,000 c.p. each, and No. 3 a standard lamp of 3,000 c.p. Nos. 1 and 2 should be fitted to a runway, and thus would be capable of being placed nearer the background or further away as necessary. Also they should be upon raising and lowering cords and would then be available either high up as toplights or near the floor for children, or alternated, i.e., one up and one down. No. 3, being of the standard type, could be moved to any part of the studio either to assist or counteract the other lamps. Good reflectors should be fitted to all the lamps.

R. P.—If you are requiring sufficient light to enable you to give, say, 1-10th sec. exposures at *f*/4.5, we should advise the "Northlight." This is a 4-carbon arc lamp fitted to a movable stand and with an umbrella-shaped reflector. This lamp, with the aid of a spotlight, would be of great convenience, and enable you to get any desired effect. The half-watt system could be used, but you would require more than 6,000 c.p. to enable such short exposures to be given. Your local electrician should be consulted in reference to fitting the necessary cables and resistance for the "Northlight," and also a wall fitting for the spotlight. It would be best to fit plugs and sockets on both sides of the studio for both these lights.

W. B.—The usual method is to place at least two small bunsen burners in the window and keep these burning during the day and night. These should be fitted by your usual gas-fitter. If your window is entirely enclosed, we should recommend that the top of the enclosure be either taken away altogether or a large-size opening made. This would allow a good circulation of air from the shop or reception-room and would consequently warm the front glass of the window. The following paste should be rubbed over the window after cleaning and then subsequently polished off: Glycerine, 10 oz.; prepared chalk in powder, 4 oz.; mix well together with a pestle and mortar and apply sparingly on a piece of soft rag. Then polish the glass with a dry rag so that no smears occur.

S. K. H.—There are several processes of colour photography which would be of use to you, all of them equally satisfactory. The Autochrome process, particulars from Mr. T. K. Grant, 89, Great Russell Street, London, W.C.1, and the Paget process, particulars from the Paget Prize Plate Co., Watford, Herts., are both transparency processes, and give excellent results, while they are both easy to work. These processes require only one exposure in the camera to produce the result in colour, but are suitable for lantern slides or transparencies for viewing by transmitted light only. For prints upon paper some method of three-colour photography must be worked. Three negatives have to be made, each through a separate colour filter, and from these three prints, which are ultimately superimposed. Having these negatives many processes are possible, including Carbon, Pinatype, etc. Of these latter perhaps carbon is the easiest to work. An interesting process was described in the "B.J." "Colour Photography" Supplement for November 3, 1922. This process, using three negatives, is both simple and effective. A book which may be of use to you is "Practical Colour Photography," by E. J. Wall, published by the American Publishing Co., of Boston, U.S.A., but obtainable from our publishers, Messrs. Henry Greenwood & Co., price 13s. 3d. post free. The colour filters necessary for making the negatives may be obtained from Messrs. Ilford, Ltd., Ilford, London, E.

E. A.—The system of incandescent acetylene light has been so very little used that we ourselves have not had experience of it, and there are very few people, we think, who have. We saw some demonstrations of it some ten years ago at the premises of Messrs. Newton & Wright, 72, Wigmore Street, London, W.1, when it appeared to be just as satisfactory for the projection of lantern slides as the ordinary oxy-hydrogen lime-light. And of course no condenser was used, since the rays from the tiny pastille are brought to a focus by means of a metal mirror. We should say that the intensity of the light is at least six or seven times that of a 120 c.p. half-watt lamp. So far as we remember the light is fairly constant over a period of, say, one or two hours. We have no data as to consumption of acetylene. Possibly Messrs. Newton & Wright could give you further details.

G. M.—We are afraid your studio is hardly large enough for very serious work. You could, however, get bust portraits or even half-length figures with a lens of not longer focus than 6 inches. We should imagine, when working from the extreme end of your studio, that the available distance between camera and sitter would be only about 6 ft., which distance is insufficient for larger work. For children you would require a small table or platform, otherwise you would get distortion due to the awkward angle at which you would have to work. With reference to lighting, we think your present arrangement is quite inadequate. Your windows are too small, but if you could merge the two into one, at both sides of the studio, and carry them down to about 2 ft. from the floor, you would then get better illumination. Also you want a top light, and to obtain this the roof should be glazed to within 4 ft. of the door end. With these alterations, providing you are not shut in by high walls, you would have quite a good amount of light. However, even with this arrangement, it would be necessary to have some other source of illumination near the floor, otherwise the lighting would be too heavy at the top. This could be arranged by having white tilting reflectors on either side of the studio and adjusting them as you find necessary. If electricity is available you could then use the studio as it stands and rely upon the artificial light only. Two lamps of 3,000 c.p. each would be sufficient for bust portraits, but more would be needed for children. We cannot give you any idea of the cost of fitting electricity into your studio, however, as so much depends upon the distance the supply is from you, and local charges, etc. You could best obtain this estimate by applying to an electrician who would be prepared to do the work. Acetylene would be hardly suitable in so small a studio.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. PRICE FOURPENCE.

TERMS OF SUBSCRIPTION POST FREE.

UNITED KINGDOM OR CANADA.—*One Year*, £1 1s. 8d.; *Six Months*, 10s. 10d.; *Three Months*, 5s. 5d.

ANY OTHER PART OF THE WORLD.	*One Year*	£1 3s. 10d.
	Six Months ...	12s. 0d.
	Three Months	6s. 0d.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibits the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3265. Vol. LXIX. FRIDAY, DECEMBER 1, 1922. Price Fourpence.

Contents.

SUMMARY.

In the first portion of a contributed article Mr. Chris J. Symes deals very completely with the working methods which, in his experience, have proved most satisfactory in the Bromoil and Bromoil-transfer processes. (P. 723.)

A simply constructed reflector for the half-watt lamp in portraiture is described and illustrated by a contributor. (P. 725.)

It is officially announced by the Professional Photographers' Association that preparations are being made to hold an "abbreviated" congress at the Photographic Fair to be held at Holland Park Hall from March 15 to 24 next. (P. 729.)

A healthy sign of the demand for photographic goods is supplied by the report of Messrs. Ilford, Limited, for the year ended October 31 last, which discloses a net profit more than £10,000 in excess of those of the preceding twelve months. (P. 721.) A tabular review of the profits earned during the past twelve years will be found on page 730.

We regret to record the death of Mr. Vaness C. Baird, who for nearly forty years was an office-bearer in the Dundee and East of Scotland Photographic Association. (P. 726.)

Automatic focussing vertical enlargers and a pyro-iodide developer are among the subjects of recent patent specifications. (P. 726.)

A good deal can be done to systematise the practice of making prints on bromide paper by the use of a graduated test plate in conjunction with a series of exposures of different times. (P. 722.)

The recent serious explosion in the East End of London, caused by mixing sulphur and chlorate of potash, provides a warning of the strongest kind against the home preparation of flash powder, which necessarily is akin in composition. (P. 721.)

An aid to correct placing of a portrait within the space which it will occupy in the final print is described in a paragraph on page 722.

In tank development of portrait negatives it is preferable, we think, to renew the entire solution fairly frequently rather than to strengthen it from time to time with more concentrated developer (P. 722.)

Exceptions to the law of the diminution of light known as "inverse squares" are often neglected by photographers through omission to observe that the law applies only to a point source of light. (P. 722.)

"COLOUR PHOTOGRAPHY" SUPPLEMENT.

In a contributed article Mr. H. H. Featherstone outlines the practical methods for the making of three-colour prints by the Bromoil transfer process. (P. 45.)

An enthusiastic French worker of the Autochrome process has put forward the suggestion that the blueness, sometimes encountered in Autochrome transparencies, is due to abnormal composition of solar light, which in turn is the result of sun spots. (P. 48.)

M. Edouard Belin, well known as an inventor of telegraphic transmission of photographs, has devised a non-intermittent mechanism for cinematograph cameras and projectors which, it is claimed, will greatly simplify the problem of colour cinematography. (P. 46.)

EX CATHEDRA.

Flashpowder. It may be remembered that in the early part of last month an explosion took place in a drug store in Sidney Street, Whitechapel, London, E., as the result of which one person died and two others sustained serious injuries. At the preliminary inquiry it was ascertained that packets of sulphur and of potassium chlorate were on the premises, and a pestle and mortar were found near to the scene of the explosion. It has now been officially reported through the London County Council that the explosion was caused by friction in the mixing of the above-mentioned chemicals, which, apparently, were being used for the manufacture of fireworks. It may be as well to lay emphasis upon this incident in reference to the home manufacture of flashlight powder. Although we do not suggest that flash powder, as employed for photographic purposes, is a mixture equal in explosive properties to one of chlorate and sulphur, yet it is very desirable that photographers should recognise that every flashlight mixture is at any rate akin in composition. It would not be a flashlight mixture if it were not. While such mixtures may be kept and ignited without any substantial danger, it is a very different thing when it comes to preparing them oneself. The risk of explosion when grinding together the components of a flashlight mixture is so great as to amount to a practical certainty. The constituents require to be separately ground to the finest possible powder, and even when that is done, the greatest care taken to avoid friction or pressure in compounding the mixture. The whole process is one so charged with danger that for many years past we have consistently discouraged the home preparation of any flash powder whatever.

* * *

The Ilford Dividend. As announced in the financial papers, the net profit made by Messrs. Ilford, Limited, for the year ended October 31 last is £52,235, out of which the directors have allocated a dividend of 8 per cent. on the ordinary shares. The result of the year's trading must be exceedingly satisfactory to those in charge of the Company and to the shareholders, whilst the successful financial outcome forms an undeniable testimony to the merits of the Ilford Company's products in the eyes of users, not only in this country, but in the many markets overseas where Ilford plates and papers have been held in esteem for a generation. As will be seen from the table which we print upon another page, the net profit made by the Company in each of the three complete years prior to the outbreak of war was £33,000 in round numbers. For the years ended October 31, 1914 and 1915, the profit fell to £22,900 and £27,300, respectively. From 1916 to 1921 it has fluctuated between £35,100 and £48,000, reaching this latter figure in 1916. The dividend on the ordinary shares, which remained at 6 per cent. from 1916 to 1918 and was raised

to 8 per cent. for the years 1919 to 1921, has now been maintained at the latter figure, which, we believe, has not been exceeded since 1902-03.

* * *

Tank Development. During the past few weeks we have encountered several cases in which tank-users have complained of poor, flat negatives. In each case it has been found that the trouble was due to exhaustion of the developer, either by an excessive number of negatives or more commonly by intermittent use for too long a time. Many who have been accustomed to dish development seem to imagine that the degree of dilution of a developer does not affect its working capacity, and they overlook the fact that even when more or less protected from the atmosphere the deterioration of a diluted developer is much slower than that of a concentrated solution. It should be understood that we are referring to large tanks as used for portrait work, and not to the smaller amateur ones in which fresh solution is used each time. The practice of keeping a tank solution up to its work by adding fresh strong solution is not conducive to uniform work, as it is not possible to eliminate the bromide absorbed from successive batches of plates. It seems better to use a weaker solution and to renew it more frequently, the increased time needed for development not being of so much consideration as the quality of the negatives.

* * *

Filling the Space. A failing which many photographers, professional or amateur, labour under, is that of placing their subjects awkwardly upon the plate. The figure is either too high or too low, or too much to one side or the other, or the figure cuts the margins in an ungraceful manner if a full-sized print is required. If the knife can be used freely upon the print the fault is easily remedied, but if a half-plate print be ordered, the sitter is not likely to be pleased with a quarter-plate one. An obvious method of overcoming the difficulty is to enlarge the satisfactory portion to the desired size, when the result is often better than would have been obtained directly in the camera, but the obviously correct course is to give more attention to the spacing of the figure upon the ground glass. A useful aid to this may be found in a card mask, the exact size of the trimmed print, which is fixed in contact with either surface of the focussing screen which will clearly define the limits of the plate. A hand mirror may be used to erect the image until the necessary experience has been gained, as many people are misled by the inverted image. It is also a good plan to inspect the focussed image from a distance of 12 or 14 inches, whence faulty placing is more easily detected than from a nearer position.

* * *

Inverse Squares. The familiar law of inverse squares, according to which illumination from the source of light falls off inversely as the square of the distance, is one of those formulæ the truth of which is very often distorted by applying it under conditions in which it does not hold good. Strictly, the rule holds good only in reference to a source of light which is a mathematical point, without area or magnitude, and it fails in proportion as a light-source departs from this definition. Thus, while the illumination produced by a very small source of light, such as the oxy-hydrogen lime-light or a "Pointolite" arc lamp, would follow the rule, it cannot be assumed that the law applies in conditions which prevail in many photographic operations; for example, the use of an incandescent gas burner or electric filament lamp for the exposure of paper behind a negative placed at a distance from the light which is not many times the dimension of the light itself. Moreover, the use of screens or reflectors which diffuse a source of light, that is to say, scatter it in all directions, causes a very substantial departure from the law. We are reminded of these matters by an article in the issue of the "Gas Journal" of November 22 last, in which the author, Mr. A. Renfred Myhill, draws particular attention to quite ordinary conditions in the illumination of surfaces in which the law of inverse squares ceases to apply.

SYSTEM IN BROMIDE PRINTING.

ALTHOUGH at first sight bromide printing, or perhaps more correctly, printing upon papers requiring development, may appear to be a very simple process, it affords almost unlimited opportunities for total or partial failure. It is not difficult for anyone of average intelligence to master the details of exposure and development, but it is quite a different matter when it comes to reproducing upon paper anything like the full scale of tones which is found in a good negative. It may be contended that there is no recognised standard of quality in negatives, but for all practical purposes it may be assumed that a negative exhibiting full detail in the high-lights with as much shadow detail as the producer wishes to appear in the shadows while possessing sufficient density to give a satisfactory colour by development alone, will satisfy most photographers. The question now to be considered is the selection of a paper which will give the desired print from the type of negative which any particular worker regards as satisfactory, and it is not easy to select such a paper from the hundreds of varieties now offered.

The effect of such a bewildering variety of papers seems to be that of unsettling the mind of the worker who finds that with one grade he can secure good prints from negatives which he considers as rather poor in quality, while his good negatives give rather harsh results. If another grade had been tried a totally different conclusion might have been arrived at, and so hundreds of photographers wander through the desert of perplexity during the whole of their career without finding satisfaction.

There is, fortunately, a comparatively easy method of ascertaining the capabilities of any sample of bromide or similar paper; it is by using a step wedge. For our purpose a step wedge may take the form of an ordinary half-plate of ordinary rapidity which has been exposed in strips in the same way as when making a strip test with a negative, but without a negative. Each strip may be half an inch wide, and if the series runs the narrow way of the plate, twelve strips can be obtained. The ratio of exposure between the successive strips, may be chosen so as to give a steep or shallow gradation, that is to say, exposures may be given in the ratio of 1, 2, 4, 8, and so on, or of 1, 1½, 2, 3, 4, etc., or even 1, 2, 3, 4, 5, 6, the object being to secure a negative which appears like a Venetian blind with the laths gradually increasing in density from one end to the other. After exposure, the plate should be developed in a safe light, using a non-staining developer, until no further reduction of silver takes place, when it must be thoroughly fixed so that it will not change colour subsequently. We have now an instrument with which we can gain some useful information. We may find, for example, that the normal paper of one maker gives a harder result than the "contrasty" of another, and so forth.

A convenient way of using our "wedge" is to place a

full-sized piece of the paper to be tested behind it in an ordinary printing frame, and to make another series of step exposures at right angles to those on the plate. If these are given in the ratio of 1, 2, 4, and 8, we shall have four graduated strips, in each of which any given degree of density has shifted its position to one lower down the scale with the successive exposures. If we wish to compare two papers for rapidity only, we place strips of each side by side and expose and develop as if they were on the same paper. It is then quite easy to see the necessary variation to be made in exposure when actually printing. It may avoid annoyance, or even loss, if new batches of paper are tested in this way against the previous deliveries. We have found a variation in the speed in the ratio of 1 to 2½ in two gross packets of paper of the same brand, the same grade, and purchased at the same time, the emulsion numbers only being different.

The real value in this system of testing lies in the fact that the capabilities of any paper are displayed in a much clearer way than is possible by making trial prints from an ordinary negative. If we test two papers and find that on one we can discern ten gradations between the faintest tint and full blackness, and with another we can only get four, we have learned that the first paper is suitable for a fully-exposed negative of ample density, while the other requires a mere ghost of an image.

Now that developing materials have reached a lower price level, there is no excuse for using a developer until it is incapable of giving a good print in a reasonable time. Exhausted developer is answerable for much poor work, for not only does the reducing agent become used up, but every print adds its quota of bromide to the solution. It is difficult to give any proportion between area of paper developed and bulk of solution, since dark full-out prints naturally exhaust a developer sooner than light sketches, and therefore, perhaps, the best plan is to note the time taken for the first appearance of the image in a fresh solution, and to keep the strength up to such a point that this time is not greatly exceeded.

Now that printing boxes are so generally used, much poor work is caused by printing thin negatives with a strong light. Not only is it impossible to get uniform exposures when these are a second or less, but the quality of the image so obtained is never equal to that obtained by a softer light. This may be obtained by interposing thin paper or opal glass between the light and the negative. It is often more convenient to use a piece of opal immediately in contact with the back of the negative, than to open the cabinet to put in a screen.

Time of development is a most important factor in printing. With most papers a decent colour cannot be obtained with less than a minute's development, while two minutes is better; therefore, the exposure should be regulated and the paper selected so that full development can be given. There is no more time occupied, as four or five prints can be developed at once for two minutes, while if only short development is given each must be done singly.

BROMOIL AND BROMOIL TRANSFER.

Bromoil and Bromoil transfer are most fascinating processes, and, year after year, the numbers of advanced workers who take up one or the other increases, but many of them give it up on account of the lack of reliable and up to date information, and the numerous difficulties they encounter. It is seldom, indeed, that their special trouble is referred to in text-books, and real experts are few and far between; so there is no one within reach to put them right or even to suggest methods of tracing the fault. Many of the processes advocated from time to time are unnecessarily complicated, so that a simple and reliable way of working will be a boon to those workers who want to have absolute control.

No other process in photography gives the same quality as Bromoil or Bromoil transfer, and with the exception of bromide (with which control is very limited) they have no serious rival for exhibition work. The results are permanent, consisting only of pigment on gelatine or paper.

Most photographers have some idea of the method employed, but for those who may not have heard anything of the processes, it may be explained that a bromide print is bleached in such a manner that the gelatine of the emulsion will attract an oily pigment in such proportion as the light has acted, the pigment forming the image on the gelatine. A transfer is the pigment image of the Bromoil transferred by pressure between rollers to another piece of paper.

To begin, the character of the negative has an important bearing on the print. It should be fully exposed and lightly developed. There should be plenty of detail in the shadows, but no great density anywhere. As an example, where the average exposure indicated by a meter is about a 75th to 100th it is advisable to give about a 25th, and develop with a weak developer, say half the normal strength, for the usual time for full strength which with most plates of average speed will be about 2/4 minutes according to the developer used. The negative should be very slightly thinner than one which is intended for bromide enlarging simply. The bromide print may be made by contact or enlargement, although in the former case the negative should be very much stronger than indicated above, but as the majority of people now use small plates and enlarge them subsequently, perhaps it would be better to assume that an enlargement is generally used for Bromoil.

The first thing to consider is the make of paper. Since the war, manufacturers, as a whole, have had some difficulty in obtaining gelatine for their emulsions of pre-war quality, and very few of present-day papers are really suitable for this process. A number of makers supply special Bromoil papers, and whilst most of these are suitable for Bromoil, in a very few cases, indeed, are these papers also suitable for transfer. Amongst the papers which I have tried and found suitable are:—

Kodak "Royal"	(White and toned).
Kodak Velvet.	
"Vitegas"	(Specially prepared for Bromoil).
Barnet	(Cream crayon natural surface).
Barnet	(Smooth and rough ordinary).
Barnet	(Tiger tongue).
Barnet	(Semi-matt Card).

Of these Kodak "Royal" is suitable for Bromoil and transfer; "Vitegas" and Barnet "Cream Crayon," "Rough Ordinary," and "Tiger Tongue" for Bromoil only, and Kodak "Velvet" and Barnet "Semi-matt Card" and "Smooth Ordinary" for transfer only.

The type of print to aim for is one with a distinct but slight deposit in the highest lights and no absolute black in the deepest shadows—in short, a print that is rather on the flat side. At the same time, development must be full, and carried as far as possible. At a temperature of 65 deg., the prints should be in any ordinary M.Q. developer for 4 minutes, and in cold weather the time should be extended

until one is absolutely sure that development is complete. That is to say, the minimum correct exposure must be accompanied by the maximum development.

Any ordinary developer will serve. I think (and most Bromoil workers with whom I have been in touch agree with me) that the developing agents have only a slight if any bearing on the final result. My usual developer is M.Q. which differs very slightly from the Kodak formula, and I have also used Amidol. There has never been any noticeable difference in the behaviour of the prints during subsequent operations, which could be due to the developer.

The prints should then be fixed in a *plain* hypo solution—3 ozs. of hypo to 20 of water, fixation must be complete, and to ensure this it is advisable to leave the prints for at least 15 minutes in the solution if thin paper, or 20 minutes if thick paper is used. On no account should acid hypo be used, as in nine cases out of ten, the print fixed in this solution will refuse to bleach. The print should then be very thoroughly washed—two to three hours are essential, for, if there is the slightest trace of hypo in the emulsion during the bleaching operation, trouble will ensue.

The reason why a thin negative is so advisable is obvious from the foregoing, because with a negative that is at all fully developed it will be impossible to get a bromide print of the character described above. At this point I would advise prospective "Bromoilers" to leave a blank margin of about half an inch all round the print, so as to safeguard the brush from moisture during inking.

The next operation is bleaching, the most important operation in the process. This may be proceeded with immediately washing is finished, or, preferably, in my opinion, the print may be dried and bleaching and the subsequent operations done afterwards. So far as I can see, there is no reason why a print should work better after being thoroughly dried except that the gelatine hardens a little on account of the drying, but it always seems to ink up easier after drying than if one proceeds directly after washing.

There are innumerable bleaching formulæ; I have tried many of them, and after a considerable number of experiments with several, evolved the following and find that is the best in my hands for all-round use. It consists of two solutions as follows:—

A.	Copper chloride	160 grs.
	Sodium chloride	2 ozs. 292 grs.
	Hydrochloric acid	3 minims
	Water	10 ozs.
B.	Potassium bichromate	55 grs.
	Water	10 ozs.

For use take 1 oz. of A, 1 oz. of B, and 2 ozs. of water.

It is rather important that the purest ingredients obtainable should be used, that the amounts as given should be exact, and that large amounts of solution should not be made up, as the B solution does not keep very well. The copper chloride in solid form is very deliquescent, that is, it absorbs water from the air readily and consequently should be kept in a well-stoppered bottle. Solutions A and B should not be mixed until immediately before they are required. The potassium-bichromate solution is inclined to become stale after three weeks, so, unless one is constantly using these solutions, it is better that this should be made up in small quantities as required. Solution A keeps for any length of time. Any excess of undissolved sodium chloride (common salt) should be allowed to settle on the bottom of the bottle.

It is most important that all dishes and utensils used in this process should be absolutely chemically clean, and for bleaching especially a dish should be set aside for this purpose and no other. Before bleaching the dry bromide print, it should be placed to soak for 5 minutes in water at a temperature of about 65 deg., or until limp. Not only will this help the bleacher to flow evenly over the print, but it will render the surface of the emulsion into such a condition that the ink is more readily removed if desired than if the dry print had the bleacher poured directly over it.

The damp print is now drained of surface moisture and placed in a dish, and the ready-mixed bleacher is poured on in an even sweep. Eight ozs. will bleach four 15 × 12 prints, and it is not advisable to try more. In about half a minute the effects of the bleacher will begin to be visible, and in about 3 to 3½ minutes nothing but a faint brownish image will remain. The print should be left in the bleacher for a quarter of a minute after the last vestige of black has disappeared from the print. The time of bleaching gives an important indication as to whether subsequent operations are likely to be successful. If it takes more than 3½ minutes or at most 4½ at 60-65 deg., either the print has not been thoroughly washed or the bleacher has not been mixed in the proper proportions. If it takes less than 2½ minutes, it shows that the print has been under-developed and a flat and muddy Bromoil is likely to be the result. Prints should then be washed in running water until the yellow stain has gone. This usually takes about 15 minutes. The print should then be fixed in a solution of hypo of the strength of about 2 ozs. of hypo to 20 of water for five minutes. The temperature of both bleaching and fixing solution should never exceed 65 deg. F. In the fixing bath the print changes from a faint brown to a very faint greenish grey.

After fixing the print should be washed in running water; if for Bromoil for at least half an hour, if for transfer 15 minutes is enough.

Then the print is put to soak in plain water at a temperature which varies according to the make. During this operation the gelatine absorbs water in the opposite direction and in proportion to the action of the bleacher, *i.e.*, in the high lights the maximum is absorbed, in the half-tones about half, and in the darks little or none at all, and as the oily ink employed is repelled by water, it is only accepted by the emulsion in the same degree as the gelatine is tanned or hardened by the bleaching solution.

The temperature at which the prints should be soaked varies according to the make of paper; some are ready for inking directly after washing; others require an initial temperature of as much as 90 deg. F., while the average is from 70-80 deg. F.

The temperature should not be maintained throughout the period of soaking; the water should be at the point indicated by experience as the best for the paper when the print is put in and allowed to cool to the level of the temperature of the room, very little water being absorbed by the gelatine at a normal temperature by those papers which require heat.

The time of soaking also varies and must be found by experiment. As a general rule from 15 to 45 minutes is sufficient. If a number of prints are being treated they may, when soaking is complete, be transferred to cold water in which they will maintain their condition for a few hours. As a guide, the temperature and time of soaking usually required by the papers above-mentioned are as follows:—

Kosmos "Vitegas" for Bromoil	60 deg.—ready after washing.
Kodak "Royal"	75 deg.—20 minutes
,, "Velvet" ...	75 deg.—25 ,,
Barnet (thin)	70 deg.—20 ,,
(All grades mentioned above) (card)	75 deg.—30 ,,

Some workers prefer to dry their prints after washing, and in the case of papers with a soft emulsion, such as "Vitegas," it may be an advantage. Personally, I think it better to go straight through, but it should be remembered that each wetting and drying hardens the emulsion a little, so that longer soaking and higher temperature are required to bring the paper to the right condition.

At this stage, if the surface moisture be blotted off, the

image may be seen in slight relief, the amount of which is some guide as to whether the print is ready for inking: with most papers the relief is distinctly perceptible, with others it is pronounced, and some do not show it at all. One soon acquires sufficient knowledge to judge, however, if the soaking has been accurate, though it should be mentioned that usually the absence of relief indicates insufficient soaking and too violent a relief the reverse.

Another pointer is given by the feel of the paper in the water: the high-lights are slippery and soapy, and the shadows rough to the touch when the print is ready.

Neither of the above are really reliable indications, for different batches of the same paper vary in both feel and amount of relief. The only real proof is the manner in which the ink takes during the next operation.

Before describing the process of inking it would be advisable to discuss the materials necessary, which comprise ink, brushes, plate-glass, petrol, cotton wool, palette knife, and a supply of blotting paper.

Inks.—These are made specially for the process by Sinclair's and Griffin's both of London, and Horsell's, of Leeds. Some lithographic inks are suitable, but it is so much trouble to find them out and try them that it is far better to leave them alone and stick to those specially manufactured. These are excellent, of fine grain, and of the right consistency to start. Mediums are also made by the above firms, and each should be used with their makers' inks, or megilp may be used with any. A start may be made with, say, "Encre Machine" (a hard black), Burnt Umber, or a softer black such as "Encre Taille Douce," and such colours as the worker fancies. Colours used by themselves are seldom satisfactory; they require a proportion of black to give them strength.

Brushes.—Without exception, nothing but those made for the process are any good. The best are those made of genuine pole-cat hair, but they are very expensive and nearly impossible to procure. (I was recently quoted 65s. for a No. 28!) Those obtainable from Sinclair's and Griffin's are very reliable and not so very expensive. For a beginner, a large brush (24 or 28) and two small ones are necessary (say Nos. 14 and 10), and these may be added to from time to time.

Plate-glass.—A piece of plate-glass is about the best thing to place the print on for inking. It should be a good bit larger than the largest size worked. Three-ply wood is a fair substitute if covered with wet blotting paper, but nothing is quite so good as glass. Another piece of glass is required for a palette, on which the ink is spread with a

Palette Knife.—This should be a stiff one with a rounded narrow joint—an ordinary table knife will serve.

Petrol.—Is required for cleaning brushes, palette, and sometimes prints.

Cotton Wool.—Is used for swabbing the surface of the print before inking, and comes in very handily on numerous occasions.

Blotting Paper.—May be photographic or ordinary—fluffless is best.

CHRIS. J. SYMES

(To be continued.)

AN INEXPENSIVE REFLECTOR FOR HALF-WATT LAMPS.

THERE are, no doubt, at this season of the year, many studio proprietors who have in mind the installing of a half-watt lighting system. Although the arrangement of the system is comparatively

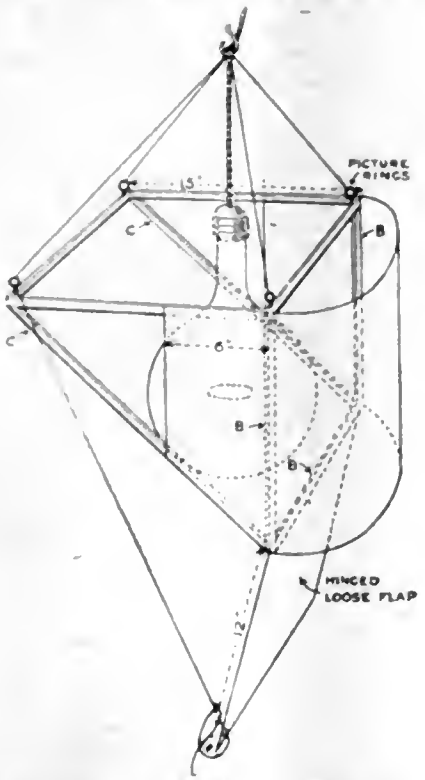


Fig. 1.

simple, there are accessories which, for convenient working, are essential and often expensive; one of these is the reflector.

It has been noted from experience that, generally speaking, there is a great wastage of light in most photographic studios; much of the available light going anywhere but in the direction required. A suitably constructed reflector is, therefore, a great asset. This does not mean that all light should be directed harshly towards the sitter, for it must be realised that a certain amount of stray light reflected from walls and ceiling plays an important part in the general softening of the artificial lighting scheme and is thus valuable in its way. At the same time, it is desirable that the majority of the light should find its way, either directly or by reflection, towards the sitter. Control, by diffusion or other means, is then in the hands of the operator.

With these facts in mind the writer desires to suggest a design for a simply constructed, inexpensive reflector for half-watt lamps.

The reflector suggested is for use in a system of lighting where each lamp is an individual unit. Many arrangements make use of a large reflector common to the light from a number of lamps; but it has been found considerably more convenient to have each lamp and its reflector available individually for disposal according to the peculiar need of the effect in view at any particular time, so that the lamp may be raised or lowered, or otherwise disposed, in its complete form.

The diagram, it is hoped, will clearly illustrate the idea, and also provide a guide for construction.

The materials required are simple and inexpensive. They are:—Wood 12½ feet of ½-inch by ¾-inch stuff; a quantity of cardboard; and a supply of bright tinfoil or leadfoil. These, together with a few screws and picture rings, and a yard or two of cord, are all that is necessary for one reflector.

If expense is no object, the appearance and stability of the article can be enhanced by the use of thin sheet aluminium instead of the cardboard and tinfoil. This metal can be obtained at most large ironmongers about 9d. per square foot.

Now proceed as follows: Cut four lengths of wood 15 inches, and make the square top framework, the ¾ inch way being the depth of the outside. The method of joining, being of little importance, is left to the discretion of the maker. Next cut three more pieces 15 inches long and join two to the top framework, the other making the bottom bar of the back portion, B. B. B. Then join the loose ends of back and top parts by struts 22 inches long,

one at each side, C. C. To complete the wooden structure, trim up the joints, and then affix screw eyes in the top as shown.

A piece of cardboard is now required (outlined in Fig 2), 30 inches long by 15 inches, at its maximum width, tapering (from 6 inches from each end) to the end to a width of 9 inches. If aluminium is used, it must be cut to this size. Having marked a point 6 inches from the back along the top side bars, secure the top corner of the cardboard to these points. Next secure the cardboard to the top back joint of framework, keeping the top edge flush with the top of the bar. The lower edges will now be in position along the structs C. C. and just require fixing. Now arrange the unsecured, wide portion of cardboard in the semi-circular form shown in Fig. 1.

Having cut a piece of cardboard (or aluminium) 15 inches by 12 inches, attach it by a tough piece of cloth, hinge fashion, to the bottom bar of the back framework. A length of thin cord is fastened to the top front corner of the framework—to the picture ring will do—and is passed loosely through a hole in the corner of the loose flap.

The idea of this flap is that, by its means, the rays of light passing downwards may be reflected towards the sitter, the looseness of the flap allowing it to be adjusted to any angle according to the height of the lamp.

Therefore, the cord is left free at one end in order that it may be secured at the length necessary to give the required tilt to the flap. The position of the filament in most half-watt lamps is such that this adjustable reflecting surface is a great asset, making use of those rays which would otherwise pass directly downwards.

If aluminium has been used, the reflector is now complete, but in the event of cardboard being the material, it remains to cover

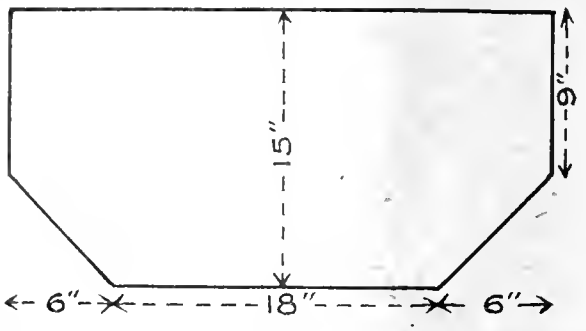


Fig. 2.

the inner or reflecting surfaces with the bright tinfoil, polishing afterwards with a soft duster. The writer used tinfoil in which Kodak films had been packed, straightening it out carefully first, and attaching to the cardboard by a narrow margin of glue near the edges.

Cords or wires are now attached to the four picture rings on the top framework, and then secured to the pendant from which the lamp is swung.

This reflector is quite efficient; adjustments may be required to suit peculiar conditions, modifications in measurements will be required for various sizes of lamps. But the suggestion is a guide to any who may need an inexpensive reflector for half-watt lamps.

F. W.

DEATH OF MR. VANESS C. BAIRD.

We are sorry to record the death of Mr. Vaness C. Baird, connected for nearly forty years with the Dundee and East of Scotland Photographic Association, during thirty-seven of which he served continuously as an officer, three years as treasurer, twenty-five years as secretary, six years as president, and three years as a member of council. Mr. Baird was one of the leading spirits in the establishment of the Scottish Photographic Federation, and at the time of his death was the president of this body. He was a frequent exhibitor at the Scottish Salon, and, as a specialist in architectural photography and in lantern-slide making was accustomed to contribute examples of his technique in these fields of work. Two years ago the award of the Macdougald Plaque for the best print in the Scottish Federation's folio was made to him.

FORTHCOMING EXHIBITIONS.

December 9 to 31.—Rochdale Amateur Photographic Society. Particulars from the Hon. Secretary, W. Lord, 10, Derwent Street, Rochdale.

1923.

February 5 to March 3.—Northern Photographic Exhibition, City Art Gallery, Manchester. Latest date for entries, January 12. Particulars from the Hon. Exhibition Secretary, Walter Johnson, 30, Hartington Road, Chorlton-cum-Hardy, Manchester.

March 1 to 8.—Birmingham Photographic Society. Latest date for entries, February 15. Particulars from the Hon. Secretary, J. E. Breeze, 178, Broad Street, Birmingham.

March 2 to 31.—Pittsburgh Salon of Photography. Latest date, February 5. Secretary, Charles K. Archer, 1,412, Carnegie Building, Pittsburgh, Pa., U.S.A.

March 13 to 16.—Exeter and West of England Photographic Exhibition. Particulars from the Hon. Secretary, R. W. J. Norton, 4, Buddle Park, St. Thomas, Exeter.

March 15 to 24.—Photographic Fair, Holland Park Hall, Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications November 13 to 18.

Cameras.—No. 31,242. Photographic cameras. E. T. Percival, and W. C. and W. R. Stevens.

Films.—No. 31,262. Photographic films. S. Cohen.

Photographic Type-setting.—No. 30,932. Photographic type-setting machine. E. K. Hunter.

Plates.—No. 31,025. Preparation of photo-cellographic plates for printing with greasy ink. M. de Sperati.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

Colour Cinematography, No. 157,196 (May 5, 1914). The invention consists in a system of cinematography and colour cinematography in which the film is moved continuously. Rays from the object form an image virtually received, after reflection on an elliptical surface, by a revolving lens. Three coloured filters, corresponding with the primary colours, are arranged in front of the film in order to record the primary colour-sensations or in the projection of the colour films. Thus, three widths of corresponding pictures are in action, instead of one, as in the ordinary methods. Edouard Belin, 272, Avenue de Paris, Le Malmaison, Ruell, France. (Details of the principle of the method and of the apparatus used in its application are given on another page in the "Colour Photography" Supplement.)

Automatic Focussing Vertical Enlargers.—No. 179,948 (May 12, 1921). The invention describes a cam-controlled automatically focussing projection apparatus in which the axis of the lens is substantially vertical and maintained normal to a horizontal projection screen or table. The object of the invention is to provide an apparatus of this type of simple and compact construction which will always prove reliable in action. A vertical support upon which the camera moves, has mounted on or adjacent to it a stationary cam or ramp. An operative connection comprising one or more pivoted levers is provided between the cam and some portion of the camera or lens so that as the camera is moved upon the support relatively to a horizontal table or screen, the relative positions of the lens and the camera back are automatically adjusted to give the correct focus.

In its simplest form a bellows camera is mounted to slide upon a pair of vertical guides between which is fixed a ramp. A lever pivoted to the base of the camera has one end connected to the lens board and its opposite end in engagement with the ramp so

that as the camera is moved upon the guides towards or away from the projection table, the position of the lens relatively to the negative or camera back is automatically adjusted by the ramp to give the correct focus. In the preferred construction, a pair of double-ended levers are pivoted to the base of the camera or to an arm or extension on the camera back. The upper ends of these levers engaging the edges of a cam plate are secured to the vertical support and the lower ends of the levers are connected through links to the lens board. When the camera as a whole is moved up and down the guides, the cam surfaces cause the levers to open or close—after the manner of a pair of scissors—and thus expand or contract the camera bellows so as to vary the relative positions of the lens and the camera back. The weight of the lens and its supporting board, with or without the addition of springs, constantly maintains the upper ends of the levers in contact with the cam plate.

Secured to the back of the camera is a hood or frame adapted to contain an electric incandescent lamp or other source of light, which participates in the movement of the camera. One or more translucent plates are interposed between the source of light and the negative to diffuse the light and, if desired, to secure proper ventilation.

In the construction illustrated the apparatus comprises a cast-iron or similar standard A adapted to be secured by means of a clamp A^1 to the edge of a table B which constitutes the projection screen or table.

Rigidly secured to the upper end of the arm A (fig. 1) is a vertical support C constituting parallel guides for the base D of a camera which can be clamped in place upon the support C by means of a clamping screw D^1. The rear surface of the plate C

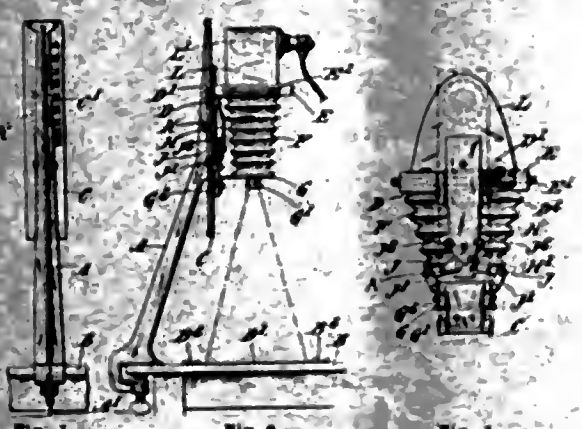


Fig. 1. Fig. 2. Fig. 3.

carries a scale C^1 with which a pointer or indicator D^2 (fig. 3) on the base D can co-operate. Secured to the base plate D of the camera is a back or support E for the negative holder E^1 the camera back being connected by bellows F to a lens board G carrying a lens G^1. The lens board is provided with a supporting foot G^2 which engages the edges of the vertical support C in the same manner as the base D of the camera back. Rigidly secured to the base of the camera D is an arm or extension H and pivoted to this arm at H^1 is a pair of similar double-ended levers J. The lower ends of these levers are connected by links J^1 to the base G^2 of the lens board. At their upper ends the levers J are provided with rollers J^2 which engage the edges of a symmetrical cam plate K secured to the face of the support C. The weight of the lens board and of the parts it carries maintains the rollers J^2 in constant engagement with the edges of the cam J and this cam is so shaped and disposed that as the base of the camera D is moved upon the guides C towards or away from the projection table, the edges of this cam will cause the levers J to open or close, thus expanding or contracting the bellows F and so moving the position of the lens G^1 relatively to the camera back E in such a way as to effect the focussing automatically. By employing a pair of levers in the manner described there is no tendency for the plane of the lens board to twist relatively to that of the negative, thus ensuring accurate focussing. Secured to the frame or back E of the camera is a hood L constituting a reflector for a source of light such as an electric incandescent lamp indicated at L^1. One or more translucent plates are placed between the source of light and the negative to diffuse the light. The apparatus above described can be readily clamped to any existing table which thus constitutes the easel or screen for supporting the paper B^1 upon which an enlarged photographic print can be projected. Any suitable means may be provided for maintaining the paper flat on the table, as for example the flat metal bars B^2 (fig. 2).

The constructional details may be varied without departing from this invention, and it will be understood that in the arrangement shown and described the weight of some portion of the apparatus will maintain the lever or levers in contact with the cam which effects the relative movement between the lens and camera back.—Kodak, Ltd., Kodak House, Kingsway, London, W.C.2 (Assignees of Edwin Coulthard Fritts, Physics Building, University of Illinois, U.S.A.).

Pyro-iodide Developer.—No. 187,932 (April 18, 1921). The invention consists in a pyro-iodide developer for a process which is described in Patent No. 187,638.

A developing solution containing potassium iodide and made from two stock solutions A and B is compounded as follows :—

A.

Pyrogallic acid	10 grs.
Water to	1 oz.

B.

Sodium carbonate	270 grs.
Potassium iodide	50 grs.
Water to	5 ozs.

For use 1 part by volume of A and 5 parts by volume of B are mixed together. In the development of cinematograph films those portions of a picture in which the degree of gradation between light and shades is at a minimum, a developer solution containing a minimum amount of potassium iodide is used. When this portion of the film has been developed, more potassium iodide is added and a portion of the film developed in which the degree of gradation between light and shade is greater than in the first portion developed. More potassium iodide is added as portions of the film having greater degrees of gradation are reached until the entire film is finished. This will result in a completed film in which not only is there evenness of lighting but evenness of gradation between the light and dark portions of the film. In making still pictures the different negatives can be developed in the same manner.

A formula for a developing solution containing potassium iodide and sodium sulphite is as follows :—

Water	8½ ozs.
Pyrogallic acid	11 grs.
Metol	9 grs.
Potassium bromide	4 grs.
Sodium carbonate	200 grs.
Sodium sulphite	40 to 60 grs.
Potassium iodide	20 to 90 grs.

Potassium iodide appears to have the property of reducing the heavy shades of an exposed emulsion without destroying the light shades so that a less contrasting or more soft picture is obtained. If, on the other hand, an amount of sodium sulphite sufficient to reduce heavy shades was used, it would destroy the light shades. It is this property of potassium iodide of reducing the heavy shades without destroying the light shades which makes it possible to obtain a uniform product as well as a desirable surface for contact transfer printing.—E. C. R. Marks, 57 and 58, Lincoln's Inn Fields, London, W.C.2, for Daylight Film Corporation, 229, West 28th Street, New York.

Roll-film Developing and Fixing Tank.—No. 184,753 (Feb. 28, 1922). This tank is a rectangular metal box, fitted with a light-tight cover. An inlet for the developing and fixing solutions is provided in the lid, and an outlet near the bottom of the box. Both of these openings also are light-tight. Beneath the inlet is a metal cross bar, fitted in a position to allow the free insertion of the film spool, but preventing the passage of the flanges of the spool beneath the bar. A strip of wire gauze is fitted to the inner surface of the lid, which presses the film below the surface of the liquid in the tank. For use the lid of the tank is removed, the backing paper of the spool of film to be developed is carefully unrolled until the usual adhesive paper at the end of the film is exposed. The end of the backing paper is then passed under the cross bar and the spool is placed in the tank between the cross bar and the adjacent end of the tank so that the paper will unwind above the film. The end of the film is secured by means of the adhesive paper to the adjacent end of the tank, and the

backing paper is folded back over the spool and the end of the tank. The lid is then placed in position and the projecting paper is drawn out until the junction of the film with the backing paper reaches the slot formed between the lid and end of the tank. The film will now be extended in a single loop lengthwise within the tank, and the various solutions may then be introduced and withdrawn in the usual manner. Amalgamated Photographic Manufacturers, Ltd., 3, Soho Square, W.1, and Max Rycott, 22, Grand Drive, Raynes Park, S.W.19.

New Books.

Pictorial Photography in America. New York: The Pictorial Photographers of America.

This collection of reproductions of work by pictorialists in the United States represents the considered choice of an association which for the past five years has actively interested itself in the advance of pictorial photography, and hence the volume obtains a greater interest as an index to the direction in which those practising photography from aesthetic motives are moving. Accepting this evidence, it seems that our friends in the States are becoming less enamoured of the low key which has characterised much of their work in the recent past. Although there is a fair proportion of work which rejoices in gloom and shadow, yet there is much more than hitherto which is the result of a more cheerful outlook upon Nature. On the other hand, many of those whose work has been chosen are evidently under the thraldom of the cubist doctrine, so that we have things like the "Grey Attic" of Edward Weston, or the "Domestic Symphony" of Margaret Watkins, which are pattern, and nothing but pattern. Fortunately these eccentricities have evidently met with little favour from the committee of selection, which, on the other hand, has given greater prominence to such finely naturalistic work as "Summertime" by Paul Wierum, "Tidewater" by Amelia H. McLean, and "House-Boats" by Ernest M. Pratt. The pages of the 70 odd reproductions are prefaced by one or two short papers, one of which, by Heyworth Campbell, is "On Ideas." Its concluding sentence is as deserving of quotation here as apparently it is in America: "A thought possibly worthy of the deliberation of every artist is that distinction is a result, never the object, of a great mind." As regards the production of the book, everything which fine photo-engraving and extraordinarily good printing can do has been done in order to make the work worthy of the objects which the Pictorial Photographers of America have in publishing it. We are not informed of the price, but last year's issue was published at $3, and, like the present volume, was issued by J. D. Drew, 63, Cliff Street, New York.

The Wellcome Exposure Diary and Calculator.—The 1923 edition of this universally appreciated diary maintains the features which have made it so popular for many years. Notable among these is the exposure calculator for use in conjunction with the numerous tables of the speeds of plates, films, bromide papers and lantern plates. The list of plate speeds now includes all the emulsions in use, including several which for some years past have been omitted. Although confined to instructions for the use of "tabloid" chemicals, the introductory pages of text (which run to more than 70) form a most precise manual for the development, intensification, fixing, etc., of negatives and for the making of prints and lantern slides. Messrs. Burroughs Wellcome have brought their little pocket book to such a state of perfection that the highest praise which can be accorded to it is that it does not fall short in any respect of its immediate predecessors. Three editions are issued, one for the northern hemisphere and tropics, another for the southern hemisphere and tropics, and a third for the United States.

State Purchase of Pictorial Photographs.—The trustees of the Public Library, Museum, and Art Gallery of South Australia have decided to include in their collection of art works a section for photographs. A commencement was made by the purchase of three photographs exhibited at the annual exhibition of the Adelaide Camera Club, held October 4 to 11, 1922.

New Apparatus.

The Sportsman Detective Camera. Sold by W. Watson and Sons, Ltd., 313, High Holborn, London, W.C.1.

Several new models of this very ingenious camera have recently been introduced by Messrs. Watson. The distinctive novelty of the camera is that, in the form of a field glass (monocular or binocular) it provides the means of taking photographs in a direction exactly at right angles to the line in which, apparently, the instrument is pointed, and since the small lens with which the instrument is fitted gives great depth of focus, the camera may be used for obtaining photographs of figures quite close to the user and immediately to his right or left without the subjects being aware that they have been recorded on the plate or film. For these reasons the camera possesses altogether special merits for the

Fig. 1.

Fig. 2.

purposes of the traveller in countries where natives have a religious or superstitious objection to being photographed.

The principle of the apparatus is very simple. The eye-piece, seen in the upper part of fig. 1, is provided with a prism and thus forms a finder, indicating the subject which lies in the field of view to the right or left. The lower part of the body forms the camera proper, which is fitted with an *f*/4.5 lens and a three-speed shutter, adjustable also for time exposures. Focussing is provided by operation of the key seen midway on the drawing of fig. 1. The pointer is set to one or other of the marks 1, 3 and 6 yards, beyond which all is in focus according to the distance of the subject. The speed of the shutter is altered by moving a stud (not shown in the figure) immediately below the finder eye-piece. The shutter speeds are 1-25th, 1-50th and 1-80th of a second. A

Fig. 3.

most ingenious method is employed for stopping down the lens. When the camera is held in one position the lens is working at the full aperture of *f*/4.5, but by turning the camera over a smaller stop, *f*/9, comes into position in the lens. Thus, either *f*/4.5 or *f*/9 can be used at will, for exposures in the hand or with the instrument placed upon a solid support. In the model at present under description, namely, the No. 2, the camera is made to accommodate either a single metal slide or a film-pack adapted for pictures of vest-pocket size, viz., 4½ x 6 cm. It may also be obtained at the same price, £14 10s., in the binocular form, shown in fig. 2, in which a changing box is made in the form of part of the body of a binocular. The changing box holds 12 plates, and is, of course, detachable for loading and unloading. Apart from this feature the only difference between the two models is that the binocular is fitted with an *f*/6.3 lens. There is also a popular model fitted with 6 slides and achromatic doublet lens at the price of £5 5s., and a de luxe model for 4½ x 10.7 cm. plates, fitted with either changing box or 12 single slides at the price of £17 5s. All the above prices include a solid leather case of the form shown in fig. 3.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, DECEMBER 4.

Birmingham Phot. Art Club. "Aerial Photography and X-Rays." Thorne Baker.
Bradford Phot. Soc. "Paget Colour Photography." Paget Prize Plate Co.
Dewsbury Phot. Soc. Table Exhibition and Discussion.
Forest Hill and Sydenham P.S. "Architectural Photography—What to Take and How to Take It." H. Creighton Beckett.
Glasgow and West of Scotland A.P. Assoc. "The Principles of Pictorial Competition." James W. Ferguson.
Halifax Scientific Society. "Colour Photography by Screen Plates." C. B. Howdill.
Kidderminster and District Phot. Soc. "Concerning Composition." A. Gordon Smith.
Southampton C.C. "Some Nature Studies." Dr. Bertram Stone.
The Camera Club (London). "Mounting and Trimming the Print." G. C Weston
Wallasey Amateur P.S. "Ancient Liverpool." W. B. Green.
Willesden Phot. Soc. "The Modern School of Painting." J. Vacy Lyle.

TUESDAY, DECEMBER 5.

Royal Photographic Society. "The Lesson of Photography." C. Lewis Hind.
Birmingham P.S. "Photographing the Invisible." Thorne Baker.
Bournemouth C.C. Leicester and Leicestershire Portfolio.
Burnley Mechanics' Institute C.C. Alliance Prints and Slides.
Cambridge and District Phot. Club. "Remarks on Development and Halation." F. J. Stoakley.
Exeter Camera Club. "Pictorial Photography, Real and Ideal." A. W. Walburn.
Hackney Phot. Soc. Print and Slide Competitions; "Portrait of a Member."
Leeds Phot. Soc. "Bromoil for Beginners." W. E. Gundill
Maidstone and District P.S. "Enlarging with the New Vertical Enlarger." S. Wicken.
Morley Amateur P.S. Members' Print Criticism Evening.
Nottingham and Notts. Phot. Soc. "Bromoil." E. L. Kent.
Portsmouth Camera Club. Ten Minutes Lecturette Competition.
South Glasgow C.C. Lantern Slide Monthly Competition and Criticism of Slides.
Liverpool A.P Assoc. "Tones by Direct Development." W. H. Cleave.

WEDNESDAY, DECEMBER 6.

Birkenhead Phot. Assoc. "Hints to the Ambitious." J. Hall.
Croydon C.C. "The Passion Play at Oberammergau." F. Ackroyd
Edinburgh Phot. Soc. "Photomicrography." W. M. Ames.
Partick C.C. "Finishing and Mounting." A. T. Edgeley.
Rochdale Phot. Soc. "Camera Metal Work." Gilbert Holt.
South Suburban and Catford Phot. Socs. "Flashlight." H. H. Featherstone.

THURSDAY, DECEMBER 7.

Coatbridge Phot. Assoc. Members' Night.
Edge Hill C.C. Judging and Exhibition of Ramble Prints
Gateshead and District C.C. Federation Prints.
Kinning Park Co-op. Soc. C.C. "North and West of Ireland." S.P.P. Loan Lecture.
Hammersmith Hampshire House P.S. "Personal Practice in Lantern Slide Making." J. Dudley Johnston.
Letchworth C.C. "The Lighter Side of Photography." W. S. Westover.
Liverpool A.P. Assoc. "On the Nile to the First Cataract." Thos. E. Briggs.
North Middlesex P.S. Special Print and Slide Competition.
Richmond C.C. "Pictorial Composition." C. Pollard-Crowther.
The Camera Club (London). "Landscape—a pot pourri." Bertram Cox.
Wimbledon and District C.C. "Lantern Slides." T. W. Derrington.

FRIDAY, DECEMBER 8.

Royal Photographic Society. "The Man behind the Camera and the Making of Portraits." C. Pollard-Crowther.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, November 28, Dr. G. H. Rodman in the chair.

Mr. J. E. Saunders, F.Z.S., delivered a lecture, illustrated by many lantern slides, entitled "Off the Beaten Track at the Zoo." The lecturer and a lady friend had become on such goods terms with animals at the Zoo that they were able to enter the cages and take photographs at close quarters. It was necessary, said Mr. Saunders, to be, first of all, an animal lover, as most of the creatures one wished to photograph knew instinctively who were their friends and who were not. It was also necessary to use apparatus which was simple in operation and as nearly noiseless as possible. The using of an ordinary plate-holder was sufficient to startle the wolf or the vulture, while a plate magazine would turn his fear to rage. Many interesting lantern slides were shown, in one of which the lady friend of the lecturer was shown painting the tooth of the hippopotamus, who weighs three tons, with iodine. This was on account of the animal having toothache.

On the proposition of the Chairman a most hearty vote of thanks was accorded to the lecturer, and also his lady assistant.

CROYDON CAMERA CLUB.

Mr. C. M. Thomas gave a lecture entitled "Photography and the Plate." As it has previously been given at the R.P.S., and fully reported, it is not proposed to do more than glance at a highly interesting and instructive discourse, a resolution accentuated by the difficulty of making notes in the semi-darkness which many slides necessitated.

Of particular interest was a photo-micrograph, over 1,800 diameters, of the grain of a dry-plate, with all sizes and curious shapes of silver particles aggregating. This, and other slides of the as-easy order, formed light relief to much heavy business in the diagram line.

The lecturer remarked that between scientists and pictorial photographers a ravine existed, ever getting wider and deeper, it being bridged only by the S curve beloved by both in very different applications. The first statement is, unfortunately, only too true, and this being so, free-lance investigators of the lecturer's type are of great value to any photographic society, as they span the gulf and enable the everyday photographer to understand a sufficiency of the principles underlying his craft. Also by expressing doubt on authoritative pronouncements, when an honest doubt exists in Mr. Thomas's mind powerful assistance is rendered to a healthy discussion. At Croydon this stopped short of reading the Riot Act.

Compared with Messrs. Purkis and Budd, and others, who simply bristled with points, a porcupine would have made but a poor show, and the lecturer also was fairly bombarded with questions. On the plaintive lament side was Mr. Walker. This popular member, ever struggling under adversity with fifty-guinea cameras, had experienced halation, which blazed into the next street, on backed, and dyed-subatratum dry plates, supported by violent irradiation within the film, and scatter due to reflection from the bellows and other causes. He appealed to Mr. Thomas for aid, who, diagnosing the case, tendered sympathy. Mr. Acroyd, too, had been in trouble with an acute "gamma" due to operating a Continental roll-film whilst abroad. A most hearty vote of thanks was accorded the accomplished visitor from Richmond.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A meeting of the Council was held on November 24, at 35, Russell Square. Present:—Messrs. Marcus Adams, Angus Basil, W. B. Chaplin, Alexander Corbett, C. F. Dickinson, W. E. Gray, Reginald Haines, H. A. St. George, R. M. Speaight, together with the Secretary (Mr. Alfred Ellis), and the Editor (Mr. Jenkyn Griffiths). Mr. Alexander Corbett in the chair.

Respecting the 1923 Congress, the Chairman and Secretary reported that, in company with Mr. Wakefield, they had seen Mr. A. C. Brookes with regard to possible accommodation at Holland Park during the Photographic Fair of March 1923. Mr. Brookes had directed them to some premises within a few minutes' walk of the hall, which consisted only of a meeting room, without provision for social gatherings or refreshments. It was then suggested that a portion of the gallery at the Holland Park Hall, immediately over the entrance, should be partitioned off, making a room measuring about 15 x 40 feet, to be used as a kind of lounge or welcome club for members of the Association. No lectures could be given in so small a space, but it would be possible, with this as an anchorage, to hold a Congress of limited scope, with one or two outings, a luncheon, and the annual general meeting, the idea being to meet the wishes of the many members who desired a spring gathering, although, owing to the fact that only six months would have elapsed since the Association's big congress, it would not be possible to hold a congress of a full-dress character so soon.

Mr. Basil proposed, and Mr. Adams seconded:

That the Association hold an abbreviated congress during the time of the Photographic Exhibition at Holland Park in March 1923, and that Mr. Brookes's offer to erect and furnish a Welcome Club, as arranged with the sub-committee, at Holland Park Hall for the period of his exhibition be accepted.

After some discussion, this was agreed to unanimously. This ruled out the proposal with regard to a separate place of meeting from the exhibition hall. It was then remitted to the congress committee to make the necessary preliminary arrangements consequent upon this decision.

The Chairman read letters from the London Press Exchange and Messrs. T. and C. Bench giving in closer detail the proposals which representatives of each of those firms had sketched to the Congress for a scheme of co-operative advertising. The Chairman expressed himself convinced that the propaganda, which was foreshadowed in both these proposals, would educate the public and be of great value to photography.

Mr. Speaight proposed, and Mr. Dickinson seconded, that a small committee be formed, of quite a provisional and preliminary character, to explore the ground covered by these letters, and to ascertain what support might be forthcoming from manufacturers and dealers. This was agreed to, and Messrs. Adams, Basil, and Haines, with the President (the Chairman of Council), and Treasurer, *ex officio*, were appointed as the committee. It was suggested that Mr. Somerville might properly be consulted in the matter. It was left to the Chairman of Council to call the first meeting of the committee, which he said that he would do within the next week.

The Secretary read the various correspondence in which he had been engaged with the members, and gave an indication of the advice he had tendered under circumstances which had varied with the individual case. Among other matters on which members had been advised were:—The insurance of a motor-car; the loss in the post of photographs sent to Italy, and the question of whether the sender or the person who had ordered them to be so sent was liable; the selection of a photographic press agent (it was agreed to refer such correspondents to photographic press agents advertising in the "Record"); electric light charges (the Secretary was instructed to write again to the correspondent in this instance to learn whether anything had eventuated since her letter of October 30); a dispute over the amount to be paid by an illustrated paper to a photographer who had executed a special commission, involving the taking of three negatives., one of which was used, and payment of one guinea forwarded, although his account sent was for four guineas (it was agreed that the photographer should be advised to pursue this matter in the county court); prices for framed enlargements; inquiries for a list of members of the Association (it was agreed, arising out of this letter, that the subject of the preparation of a list of members of the Association should be put down on the agenda for consideration at the next Council meeting); a difficulty which had arisen in sending films by post, packets containing films being charged at letter rate, although prints went through at printed matter rate (the Secretary found, on inquiry of large houses accustomed to the receipt and despatch of films, that this position was generally accepted); a controversy arising out of the copyright of portraits used during the General Election (this last was the subject of two complaints from different localities, and in the case of the second, occurring at Liverpool, which had some unusual features, the Secretary was instructed to place the matter before the Honorary Solicitor); the non-acceptance by some newspapers of the agreed scale of fees for press reproduction work issued by the Association in December 1920; the use of the words "including copyright" on the receipt form on the back of a cheque sent in payment for the use of a photograph (the correspondent was advised to strike out the words, which mostly referred to literary contributions, and in the event of the bank raising any objection, to bring up the matter with his client); a question of the assessment of profits for income tax; the procedure to be taken with regard to an advertisement, the terms of which had not been fulfilled, though the advertiser was unwilling to return the money (in this case, following upon two letters from the solicitor, the money had been returned); and various other inquiries. One member had asked the Secretary to inspect, on his behalf, a business which was advertised for sale. The Secretary, although considering that this scarcely came within his duties, did so, and reported upon it to the correspondent. The Council considered that the member making the request should pay some remuneration to the Secretary for his services in the matter (as, indeed, he had offered to do), and the fee was fixed at two guineas. The Secretary also reported that he had received a number of applications from persons who wanted situations, or members who desired apprentices. If these increased it might be necessary for the Council to formulate some rule on the subject. Finally, among other unclassifiable inquiries which came his way, was one from a lady who desired him to discover the whereabouts of her husband!

The Secretary read a list of the names of new members who had been already approved, but had now paid their subscriptions, also a list of members rejoining, and of persons making application for membership. All were approved. He reported that he had a list of members who owed two years' subscription, roughly about fifty, and the Council thereupon instructed the Secretary, as had been done on a former occasion, to send a registered letter to these members, stating that if a reply was not received within a certain period, the Council would have no alternative but to strike off their names. It was agreed that a similar course should be followed in the case of those members who had not signed the form of incorporation (these, also, were members who were in arrear with their subscriptions).

Commercial & Legal Intelligence.

THE ILFORD REPORT.—The report of Ilford, Limited, for the year ended October 31, 1922, shows a net profit, after making allowance for depreciation and provision for doubtful debts, etc., of £52,235, as compared with £41,551 in the previous year. Including £6,280 brought forward there is £58,516 available, as against £52,480 last time, when £10,929 was brought in. The directors have transferred £4,000 to reserve, the same as before, and written £10,000, as against £6,000, off goodwill. They again recommend a dividend of 8 per cent. on the ordinary shares for the year, leaving £8,316 to be carried forward, compared with £6,280 brought in. As is shown by the following table, the profits for the past year show a very substantial improvement over those for any of the preceding eleven years.

Year ended October 31	Net profit.	Ordinary dividend.	Year ended October 31	Net profit.	Ordinary dividend.
	£	Per cent.		£	Per cent.
1911 ..	35,800	6	1917 ..	42,100	6
1912 ..	33,200	6	1918 ..	35,400	6
1913 ..	32,800	6	1919 ..	45,200	8
1914 ..	22,900	4	1920 ..	44,100	8
1915 ..	27,300	5	1921 ..	41,600	8
1916 ..	48,000	6	1922 ..	52,200	8

The figures for net profit for 1916 and subsequent years are after deduction of taxation.

It must, however, be borne in mind that in 1919 the capital of the company was increased from £380,000 to £500,000, by the creation of 120,000 ordinary shares.

NEW COMPANIES.

ANGLO AND OVERSEAS PRESS AGENCY, LTD.—This private company was registered on November 20, with a capital of £100 in £1 shares. Objects: To carry on the business of press agents, etc. The first directors are:—E. Brooks, 78, Hazlewood Road, Putney, S.W., court photographer; F. V. Conolly, 48, Lorne Road, Stroud Green, N.4, journalist.

ANGLO-HIBERNIAN TRADING CO., LTD.—This private company was registered on November 16, with a capital of £1,000 in £1 shares. Objects: To adopt an agreement with Ella Spencer, and to carry on the business of agents for and manufacturers of mouldings, glass importers and manufacturers, dealers in pictures, portrait enlargers, makers of and dealers in picture frames, dealers in artists' colours, oils, paints, paint brushes, etc. The first directors are: H. Spencer, 179, Archway Road, N. (managing director); Mrs. E. Spencer, 179, Archway Road, N.; J. Savery, 101, Stoke Newington Road, N.6. The two first-named are permanent. Qualification (except H. Spencer, who requires none), £5; remuneration, £52 each per annum. Registered office: 57, Kensal Road, Westbourne Park, W.10.

N. S. KAY, LTD.—This private company was registered on November 20, with a capital of £3,000 in £1 shares. Objects: To acquire the business carried on at King Street, Manchester, as "N. S. Kay," and to carry on the business of artists, photographers, dealers in photographic materials, fine arts, etc. The first directors are:—N. S. Kay, 7a, Cambridge Road, Southport, artist and photographer; R. R. S. Kay, 7a, Cambridge Road, Southport, photographer. The said N. S. Kay is permanent director, subject to holding 500 ordinary shares. Qualification, 10 ordinary shares. Registered office: 1, Ridgefield, off King Street, Manchester.

News and Notes.

CHEMISTRY OF GELATINE.—In the leading article on page 707 of the issue of November 24 the concluding sentence of the last paragraph but two in the second column should have read: "The greater the hydrion concentration of the solution, the less is the nomerical value of the p_H."

A CAMERA CLUB IN EDMONTON, ALBERTA.—The Edmonton Camera Club has recently been formed, with its headquarters in the Y.M.C.A. Building, Edmonton, Alberta. The president is V. C. Rayment, and the secretary A. C. Fleming. The membership at present is 30. A full programme has been arranged for the forthcoming season and includes a series of fixtures dealing with the elementary processes of photography. The society will be pleased to hear from firms of manufacturers and dealers in Great Britain, with particulars of new goods which they may be bringing upon the market.

WIRELESS CONTROLLED AERIAL CAMERAS.—A new method of obtaining aerial photographs, in which the human hand of the operator is replaced by wireless, is (says the "Daily Mail") now being experimented with by the United States Army Air Service. A small kite-balloon carries up with it a camera controlled through wireless means by an operator seated at a switchboard on the ground below. Not only can the camera be made to take photographs of what lies directly beneath it, but the operator on the ground can turn the camera in any direction desired. Thus, in war, without any risk of life, it will be possible to photograph a wide area of territory by wireless cameras high in the air, and at a considerable distance from their concealed controlling points.

A PHOTOGRAPHER OF ONTARIO.—There is at present in London, on a visit which is likely to extend to some months, Mr. W. James, of Toronto, who, during the past sixteen years, has developed a unique business as a news and commercial photographer in Toronto, Ontario. Mr. James has made during this period a collection of negatives running into many thousands and forming a most complete record of industrial, social and commercial life of Ontario, as well as of its many scenic attractions. His photographs have been very largely used in the Canadian and English Press, and have also been employed by him for the illustration of lectures on various aspects of Canadian life and industry. Moreover, Mr. James has been a prime mover in the establishment of the Canadian Press Photographers' Association, and as an Englishman who left this country to seek his fortune in Canada, has always taken a keen interest in the extension of the sale of British-made photographic requisites and apparatus in the Dominion. During his stay in London he hopes that he may perhaps be of some assistance to British firms in connection with the sale of goods in Canada. He may be addressed c/o the Press Photographic Agency, 3, Johnson's Court, Fleet Street, London, E.C.4.

HAND MOVEMENTS RECORDED BY THE CAMERA.—"Working by rhythm" is a subject increasingly important. Factory workers, it has been found by the National Institute of Industrial Psychology, fall into the rhythm of their machines. If the rhythm is slow, the output is impeded. The Institute intends to go fully into the matter, and the camera is being employed to picture the hand movements of workers. It is stated that "It does not always happen that a shorter series of movements is less fatiguing than a longer one. In the packing of sweets a certain process took two seconds with three stoppages and three changes of direction of the hand. A new method was found involving a continuous curve. Although the movement was slightly longer, the time taken to performer the operation was reduced." Various methods are used by the investigators to discover the flaws in efficiency of work An electric light is sometimes fixed to a ring on a worker's finger and the path of light made as his hand moves is photographed. The difference between the movements of a good and an inferior worker can thus be detected. A method of measuring the distance of a movement is to place a board marked out in squares under the worker's feet, or behind his arm when photographs of the movements are being taken.

PHOTOGRAPHIC PORTRAITURE IN TURKEY.—Travellers in the Near East have for many years been telling us of the Turk's objection to the camera, mainly because of a paragraph in the Koran—written somewhere about the year A.D. 630—prohibiting the making of living things "with souls," and promising the portrait-maker the most terrible punishments after he has left this world. Many English people (writes a correspondent who once resided in Turkey) must therefore have been surprised to see reproduced in the daily papers of last week excellent camera portraits of Sultan Mohammed VI. of Turkey, who left Constantinople secretly and took refuge on a British ship. As a matter of fact, the Koranic law has always been something of a dead letter, for although high officials in Turkey were rather slow in taking to the camera, the Turkish man-in-the-street never had any real objection to visiting a photographic studio. It has been stated that it is only since the Revolution of 1908, when the old *régime* was overthrown, that the camera has won its way into Turkey, but this is incorrect. Even Abdul Hamid faced the camera several times, and some excellent negatives of him, taken at his Palace, were in existence in 1897, and further, one of his sons in that year freely used an English-made camera in Constantinople. "Twenty-five years ago the leading photographic studio at the Sublime Porte was almost as well fitted up as a London West End studio; the proprietor, however, made the dry plates he used.

PHOTOGRAPHING THE EX-KAISER.—In spite of the many difficulties photographers meet with when attempting to photograph scenes of the ex-Kaiser's life at Doorn some workers manage to get fairly good results. Last week the Gaumont firm issued a good series, and the following story concerning them is told by a writer in "The Star."

"The pictures were taken by Baron de Radowitz-Nei and by the painter Beumme, who was the Kaiser's official photographer before the war.

"A plan was then concocted. Wilhelm was persuaded to receive a deputation of 'The Order of St. George,' a non-political association of gentlemen of birth of the old Empire, of which Radowitz was a member.

"The deputation arrived at Doorn, and the ex-Kaiser, although he gave permission for photographs to be taken in and around the castle, would not give permission for photographs to be taken of himself.

"Eventually the deputation met the ex-Kaiser, and Beumme was carrying a large Kodak camera; the ex-Kaiser again emphasised his dislike of being photographed. In the background, however, Baron de Radowitz had a camouflaged film camera. It had been explained to Baron Landsberg (who knew nothing of the plot) that this machine was an apparatus for developing photographs, and the Baron passed this information on to the ex-Kaiser.

"No attempt was made to take photographs at this moment, however, but after the ex-Kaiser had left the deputation the photographers got busy, ostensibly taking pictures of the park and castle, and the faked camera, fitted with a long-range lens, was brought into operation as soon as the ex-Ksiser was far enough away not to be able to detect it."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

WORKING UP SKETCH NEGATIVES.

To the Editors.

Gentlemen,—Referring to the instructions on the working up of the negative, pages 7 and 8, "Sketch Portraiture," I may say that the "Seccotine" medium therein described may now be discarded by those who have access to the Aerograph.

Possessing the same characteristic qualities of effect—but of a

different composition a composition which has the great advantage of rapid drying. "Deleto," a commercial preparation marketed by the Aerograph Co., Ltd., is, in my opinion, of an eminently practical and superior nature: it offers, in use with the Aerograph, still greater possibilities of control in that it may be used for the purposes suggested, in the manner referred to, much more effectively.

Yours faithfully,

November 22. J. SPENCER ADAMSON.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5 cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

J. E.—The stain appears to be due to contact of the prints with iron rust, probably from a metal tank or dish. It could possibly be removed by soaking the prints for a few seconds in dilute hydrochloric acid solution, 10 minims of strong, pure acid in 1 ounce of water, and washing well afterwards.

A. E. S.—The "Focuslite" will be very suitable in your enlarger. Another lamp which would be found of use is the Ediswan "Pointolite," obtainable from Messrs. Edison Swan Electric Co., Ltd., 123-125, Queen Victoria Street, London, E.C.4. You could use the latter without a reflector, as the light comes from one side of the filament only. Flashed opal may be obtained from Messrs. James Hetley & Co., 35, Soho Square, London, W.1.

A. T.—Without having enlarged the negatives we think the definition should be better than it is if a first rate f/6.3 anastigmat has been used. At the same time several of the negatives are not as free from veil as we should expect them to be from what you tell us of the ideal conditions under which the exposures were made. Nevertheless, on the evidence, we think you might be reasonably justified in asking for proof that the lens can produce better results than those which you have been able to make.

P. G.—See the "B.J. Almanac" for the formulæ for red, green and other tones on bromide or gaslight papers, which are of chief value. There have been endless formulæ published from time to time, but very few of them are of any practical use. We suppose that by "zincograph" you mean the making of line blocks on zinc. It is scarcely possible to learn this process from a book, but a manual which should be of use to your friend is "Photo-Mechanical Processes," by W. T. Wilkinson, published by Messrs. Loxley Bros., Ltd., 19, Cursitor Street, London, E.C.4., price 4s.

W. G.—Pyro caustic developer with a 10 per cent. solution of pyro may be made as follows:—

A.	Pyro	1 oz. (480 grs.).
	Soda sulphite	3 grs.
	Water to	10 ozs.
B.	Caustic potash	200 grs.
	or	
	Caustic soda	140 grs.
	Water to	10 ozs.

For use mix 2 drs. A. 2 drs. B. and 2½ ozs. water. The factor could be taken as 8.

H. F. H.—From your floor plan we do not think the windows will help you much unless you actually include them in the studio. You could probably, in your present suggestion, include a little more length in the studio by taking the partition the full length of the shop, using the opposite end for the background. You could remove the present door at the camera end and hang a curtain to cover the opening. Two 3,000-c.p. half-watt lamps would give you plenty of light, and if these were upon standard fittings you could place them where they were most needed. These would hardly be enough light for children, but you could easily fit another lamp near the wall of 2,000 to 3,000 c.p. and so get sufficient light.

HANKSON.—(1) The best book on general cinema work is the "Kinematograph Handbook," by Colin Bennett, published by Messrs. E. T. Heron & Co., Ltd., 9, Tottenham Street, London, W.1. For a weekly cinematograph paper, see the "Kinematograph Weekly," published by Messrs. Odhams, Ltd., Long Acre, London, W.C.2. (2) Cinema Traders, Ltd., 26, Church Street, Charing Cross Road, London, W.I. (3) For development of negative or positive film a very good firm is the Kay Film Printing Co., 5-6 Red Lion Square, London, W.C.1. (4) Cinematograph film is supplied by Messrs. Kodak, Ltd., Kingsway, London, W.C.2, and Messrs. Criterion, Ltd., Stechworth, Birmingham, in both cases both positive and negative.

W. J. M.—It is rather difficult to explain the cause of your trouble from the prints alone, the negatives would probably tell more. However, it looks very much as if some trouble was caused by the rack in which the plates are placed, probably by the action of the developer, especially if strongly alkaline, upon the metal of the rack. When development is complete the plates should be removed from the rack before fixing, otherwise some developer would be held by the grooves and so continue its action upon the plate while in the fixing bath. We should advise the removal of the plates from the rack, and that fixing should take place in a flat dish. Again, the fault may occur after drying if the plates are still kept in the rack, owing to water collecting in the grooves and so slightly intensifying the negative.

R. G. C.— (1) If not in quite small quantities, from Messrs. S. Guiterman & Co., Ltd., 35-36, Aldermanbury, London, E.C.2. If you only want a little, no doubt you could get it through Messrs. H. Rheinlander & Son, Rodney Road, New Malden, Surrey, who supply the extra thin celluloid used for facing, and no doubt could obtain for you material of greater thickness. (2) You can get flashed opal from Messrs. James Hetley & Co., 35, Soho Square, London, W.1. (3) An enclosed arc, such as the Westminster, should work excellently in a condenser lantern. Your failures may perhaps be due not to the type of lens, for the Petzval is quite suitable, but to the use of too short a focal length of projection lens for the condenser fitted to the enlarger. If the condenser is anything above 5 inches, a projection lens should preferably be not less than 7 or 8 inches, and, better, 9 inches. (4) We think you will not be able to get the back lighting you want with a single lamp and Barkay reflector. You should try using a lamp and reflector at an angle of about 45 degrees to the axis of the lens and on the far side of the sitter in conjunction with, say, a 1,000-c.p. lamp somewhat to the front of the sitter and placed sufficiently towards the camera to give a fair amount of detail whilst not overcoming the back lighting effect. (5) We suppose you mean by this question that you get too large and strong a flood of light in, say, a head and shoulders portrait. If you want something approaching the spotlight effect you might try inserting a diaphragm a little distance in front of the Barkay reflector, but even then you will not get an effect equivalent to the use of a proper spotlight.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3266. Vol. LXIX. FRIDAY, DECEMBER 8, 1922. Price Fourpence.

Contents.

SUMMARY.

The volume of the "British Journal Almanac," for 1923, will be published throughout the United Kingdom on Thursday next, December 14. (P. 743.)

In the concluding portion of his paper on the direct and transfer Bromoil processes, Mr. Chris. J. Symes deals at length and very completely with the inking of the image, and has a great many hints to give on the causes which lead to difficulty in this part of the process. (P. 738.)

Mr. H. Kenway, in a letter, gives his practical experience of papers specially suitable for the Bromoil transfer process. (P. 747.)

In a leading article we deal with one or two of the items in Bromoil technique to which the special attention of beginners in the process may advisedly be directed. (P. 734.)

In his presidential address before the Royal Photographic Society, Mr. W. L. F. Wastell traced the evolution of the lantern slide from the painted transparencies of the seventeenth century or earlier to those which have been made from almost the earliest days of photography by one process or another, as these latter have come into use. (P. 735.)

At the Royal Photographic Society, on Friday last, Mr. Lewis E. Banfield drew a vivid picture of the almost insuperable difficulties of dark-room work in India. (P. 744.) On Tuesday evening last Mr. Lewis Hind delivered a lecture in which he considered, with great sympathy and insight, the claims of photography to be an artistic medium. (P. 745.)

At Croydon last week Mr. J. M. Sellors demonstrated (partially, for lack of time) a system for the rational exposure of bromide paper in printing or enlarging. It is hoped to obtain a more precise account of the system later on. (P. 745.)

The prospectus for next year's Photographic Fair, at the Holland Park Hall, London, W., has now been issued. (P. 733.)

We seriously question the immediate advantage of sales of wireless goods by photographic dealers, and still more the wisdom of such a policy for those who take a long view. (P. 734.)

We regret to record the death of a veteran professional photographer, Mr. John Terras, of Markinch, Fife. (P. 740.)

Further particulars of the failure of an enlargement company, which spread its business by profuse appointments of branch managers, are given in "Commercial and Legal Intelligence." (P. 746.)

Methods of preparing a printing surface of hardened gelatine from which impressions in dyes, etc., may be taken for use as lantern or cinematograph transparencies are described at length in a recent patent specification. (P. 741.)

A method of eliminating the dot structure in the copying of half-tone proofs is described by a correspondent. (P. 747.)

EX CATHEDRA.

Lord Carnarvon's Find.

Photographers will, we are sure, derive a great satisfaction in reading of the important discovery made by the Earl of Carnarvon on the site of the ancient Thebes. For sixteen years past Lord Carnarvon has taken an active interest in Egyptian archæological research, and the discovery of the treasure which has lain undisturbed for, presumably, more than five thousand years, is a reward upon which he is to be most cordially felicitated. It must have been a moment never to be forgotten when the chamber and furnishings of the tomb of the Egyptian ruler, Tutankhamen, were disclosed to view, and were found to include, not only great treasure of gold, but furniture, clothing, and even manuscripts, which it is to be thought will throw much new light upon the history of the Egyptian kings. Dr. Alan Gardiner, one of the greatest authorities on Egyptian archæology, has expressed the opinion that the discovery seems to be one of the greatest which has been made during the last thirty or forty years; and it is hoped that many of the objects which have been found will be available for enriching the collections of Egyptian antiquity in this country.

* * *

The 1923 Photographic Fair.

Mr. Arthur C. Brookes has now issued the prospectus of next year's Photographic Fair to be held from March 15 to 21 at the Holland Park Hall, London, W., upon the acquisition of which building he and the exhibitors are to be congratulated. The hall is a spacious building, accommodating, on the ground floor, more than twenty stand spaces, ranging in area from 726 to 1,320 square feet. These represent accommodation for exhibits which is approximately three times that which was available at the Horticultural Hall; and, in addition, there is a gallery which can be used for the exhibits of retail traders, demonstrations of processes and other attractions. The new premises thus afford the opportunity for an exhibition upon a scale in correspondence with the importance of the photographic industry; and the prospectus states that many of the former exhibitors have already notified their desire to occupy larger spaces. As was announced in our issue of last week, the Professional Photographers' Association will hold a Congress during the period of the Fair, and space will be reserved at the Holland Park Hall for their members' use as a Welcome Club. Next year's Fair thus maintains the tradition which prevailed for a number of years in Vincent Square. The full prospectus, plan of the floor and gallery and conditions of exhibition may be obtained on application to Mr. Brookes at Sicilian House, Southampton Row, London, W.C.1. Among the conditions is one that goods of German manufacture will not be permitted to be exhibited on any of the stands.

The Care of Glassware in Winter. Nearly everyone has experienced the annoyance of breaking a bottle or measure, through filling it with too hot water, and it will be found that most of these disasters take place in the winter when the glass is usually at a much lower temperature than it would be in the summer. Cheap badly-annealed glass is naturally more liable to breakage than that of better quality, but even the latter is not proof against careless treatment. The chief thing to be avoided is pouring any considerable quantity of hot liquid into a cold glass vessel and allowing it to stand still. In such an operation as dissolving soda sulphite there is little risk of breakage, even of an ordinary spirit bottle, if the hot water is added a little at a time, and the bottle well shaken so as to allow the whole surface to be warmed evenly. When using measures, a hint may be taken from the man who makes whisky toddy. He first rinses the glass to be used in hot water, pouring it away before there is time to fracture, then pouring in the quantum of hot water and finally the spirit. Read sulphite for spirit in the case of a photographer.

* * *

Wireless Goods. There are probably many dealers in photographic requisites at the present time who are moved by mixed feelings regarding the question whether they shall take up the sale of wireless apparatus. It cannot, of course, be gainsaid that there is, at the moment, an interest on the part of a section of the public in these goods, and that the sale of them will usefully yield a profit which compares favourably with that obtainable on cameras and materials for photography. Yet it may be very seriously questioned whether immediately or in the long run the sale of wireless apparatus will do the photographic dealer any good. We may cite, in confirmation of this view, the experience which a well-known dealer recently related to us respecting a similar boom of some years ago, namely, gramophones. When these latter articles were as great a novelty as wireless receivers are to-day, our friend invested largely in them and made them a prominent line of a business which previously had been solely photographic. Although ample sales were made of the machines and records, it was found at the end of the year that the profit worked out no better than in the preceding twelve months. What had been gained in the sales of the new class of goods had been lost by the smaller proceeds from the photographic articles.

* * *

To the Egress. There is, however, another and a broader aspect of this question. It is undeniable that wireless is a pastime which is a competitor with photography. It may be argued that it is a hobby more especially for the winter months, whereas photography is for the summer; but, on the other hand, a great deal of propaganda has been expended by many of the manufacturing firms in the amateur photographic trade for the purpose of maintaining sales on photographic goods through the winter months by demonstrating the opportunities for interesting work which are to be found in flashlight, enlarging, lantern-slide making, and other branches. In so far as wireless goods are offered in shops which essentially are those where photographic requisites are sold, the effect is to detach photographers from their hobby and to turn their favours in a different direction. And if that is done, there is no saying that they will return to their former interests. In short, it seems to us that, so far as photography is concerned, a share in the dealing in wireless apparatus is unwittingly fulfilling the purpose of the device which was credited to the late Mr. P. T. Barnum, who labelled a door within his exhibition "To the egress." Visitors who made use of it found themselves outside the premises. Considering how much has been done by firms large and small to make recruits for photography, it seems a pity that for the sake of an immediate profit, the continuance of which is highly doubtful, dealers of any kind should take part in a trade which offers a substitute for the proved attractiveness of photography.

BROMOIL PROCESSES.

THE article by Mr. C. J. Symes on another page is a reminder that undoubtedly the most interesting printing processes we have to-day are the allied methods of Bromoil and Bromoil transfer. Very beautiful effects, equal to old mezzotint engravings, can be obtained with a minimum of trouble, while the ease of control is equalled by no other printing process. The possibilities of these processes for pictorial portrait work have not been fully exploited, and we feel sure that the man who makes himself a proficient Bromoil worker, will find good reward for his labour. Comparatively, few workers, however, are tempted to try the processes, mainly because of the supposed difficulties. But if a thorough appreciation of the details of Bromoil and its transfer are first obtained, before attempting work the difficulties of the process largely disappear.

The process really begins in the obtaining of a suitable negative, and from the making from that of a suitable bromide print or enlargement. So many workers fail because of this early stage being neglected, but it is impossible to expect a good Bromoil from a weak, washed-out bromide print. What is required is a print which would be called a perfect example of the process, from the standpoint of subsequent sulphide toning.

To turn to the bleaching bath, many formulæ have been published, most of them excellent, but it is the same with this solution, as with developers. It is necessary to keep to one good formula and to become familiar with its action. The temperature at which bleaching should take place varies with the various formulæ for bleachers. This is an important point in the process. On no account should a bleaching solution be used warm if intended to be used cold or *vice versâ*. It may be presumed that the worker who has suggested a formula knows best how his solution should be used. Yet many of those working the process are very slipshod in this respect. We have seen, personally, prints transferred from hot to cold solutions and then back again into hot water without any idea of the failures that the change of temperatures may cause. If a bleacher has to be used warm, then the wash water and fixing bath are invariably to be used at the same temperature, and any variation will lead to failure. The gelatine emulsion of a bromide print is a very sensitive substance as regards variation in temperature, especially when wet, and blisters are easily caused if manipulation is careless in this respect. We have heard it said that draughts of hot or cool air in the room in which the Bromoil is being made cause uneven inking, and may possibly spoil the print, but we doubt whether the process is quite as delicate as this.

It is most essential that the fullest attention is paid to all the small details of the process; it is the little things that make or mar the perfection of the result. The utmost cleanliness must be observed at every stage, from the making of the bromide enlargement to the drying of the finished Bromoil. Dishes and measures must be scrupulously clean. Brushes must be free from

old dried ink, and dust must be eliminated as completely as possible. All materials should be cleaned immediately after using and put away ready for the next time they are required.

The subjects most suitable for these processes of printing are those depicting fairly strong effects of lighting. The flatter type of lighting does not always show to advantage, and should not be attempted until the worker has become fairly proficient, and able to exercise a fair amount of control over his inking. We should advise the beginner to choose some simple subject having a fair amount of light and shade. The contrasts would therefore be on the strong side, and would give the worker a chance to acquaint himself with the control in printing which is open to him. Again, we think the best size of print for a beginning should be half-plate. With larger sizes there is greater difficulty in following the idea of the picture, and more liability to get grainy, uneven shadows, owing to faulty brushwork. Also, the attempt should be made not to ink up too large a surface at once. Let the subject be covered up as pigmenting proceeds, and so yield a perfectly even deposit. The quality of the brushes and ink should always be of the very best. Only the actual inks manufactured for the Bromoil process should be used. Printing and lithographic inks may be of use to an expert who has some experience in the particular ink he is using, but for the beginner only the special Bromoil ink will prove satisfactory.

THE EVOLUTION OF THE LANTERN SLIDE.

[The presidential address, delivered recently by Mr. W. L. F. Wastell before the Royal Photographic Society, concerned an historical subject which for some reason or other has not previously been dealt with at all thoroughly. Even the voluminous German and Austrian writers on the development of photography have very little to say on the stages through which the lantern slide has passed. Mr. Wastell traced its evolution from the pre-photographic transparencies, and followed his discourse with the projection of more than one hundred transparencies representing the very many printing processes which have been employed in their day for the making of lantern slides.]

It is my desire this evening to try to bring together, I believe for the first time, a few salient facts in the evolution of the lantern slide. To the lantern itself I shall refer only incidentally, although it is obvious that without the projection lantern there would have been no necessity for slides of any kind; but it is of the slide itself, in its many forms, that I shall mainly speak.

A ray of light passing through a tiny hole in the shutter of a darkened room will form on the opposite wall an inverted image of part of the scene outside, and from this fact was derived the familiar camera obscura—a darkened room. Its invention is generally attributed to John Baptist della Porta (partially to anglicise the name), who was born in Naples in 1547. While he was a boy of 16 or 17 he published an extraordinary book, "Magica Naturalis," in which he describes his use of a convex lens to sharpen and brighten the image in the camera obscura. But he did more. Instead of relying only on the image of objects within range of the lens, he made drawings on transparent material—some of them with movable parts—and the results he thus secured were so mystifying that the term "magic lantern" arose—a term used later by Sir David Brewster in 1831. It is surely in these transparent drawings of Della Porta that we find the prototype of the lantern slide.

The method of obtaining images in a box or tent probably suggested to Athanasius Kircher the lantern which he evolved somewhere about 1640, of which I shall show an illustration later. It was a sort of inversion of the camera-obscura method. The light itself was enclosed in a box or chamber, and the image on a transparency projected by a lens in a darkened room.

But it is supposed by some that the use of such a lantern is suggested still earlier by Benvenuto Cellini (1500-1570) in his account of a séance given by an Italian priest. He says:—"After the usual ceremonies and incantations indulged in on such occasions, which were performed by the feeble light of a fire, in which an assistant from time to time threw various perfumes, innumerable troops of devils appeared." After this display Cellini and his companions declared that they saw similar apparitions of devils in the streets on their homeward journey, but such statements must be accepted with caution. Some people see strange things late at night. It is quite possible that the effects at the séance were produced, not by any form of lantern, but by the use of a concave mirror, which was used for similar purposes in Greek and Roman times.

However this may be, it is certain that a "lanterna magica" with two convex lenses was seen and described as early as 1655, and under date of August 19, 1666, Pepys says in his Diary:—"Comes by agreement Mr. Reeves, bringing me a lanthorn, with pictures on glass, to make strange things appear on a wall. Very pretty." This is just the sort of thing that would appeal to Pepys, and it is not surprising that a few days afterwards he bought both the lanthorn and a telescope from Mr. Reeves (who was a telescope maker), paying him £9 5s. for the two. The effect of the use of this lantern in public we shall see presently as the subject of an old French print.

For close on 200 years after this the hand-drawn and hand-coloured transparency held undisputed sway. Moving slides and chromatropes were introduced in 1841, and dissolving views, by the use of two lanterns, in 1846. For the so-called dissolving-view effects a triple lantern was often used later, and at the old Regent Street Polytechnic, which boasted the finest lantern-room in the world, as many as six lanterns were sometimes brought into play.

It is impossible to show any of these effects with a single lantern, but a description of them can be understood, if it is remembered that slides were produced in sets, and the lights to the lantern manipulated so that one image faded away as another was illuminated, or that the image on the screen was a combination of two or more slides in the lantern. The description is taken from the 1891 edition of Lewis Wright's "Optical Projection". "Let us suppose an English landscape, with a windmill, and millpond in front. (Query, Why a millpond for a windmill?) It may be first thrown on the screen in the fresh green of an English spring. Presently the mill turns round, then the scene dissolves (without appearing to change) into the warmer hues of autumn, and one or two swans glide gently over the glassy lake. The scene dissolves again into a tempestuous night, the sky covered with clouds, and little light getting through from the partly turned-down lantern. Flash after flash of lightning breaks across the dark sky, followed by peals of thunder (produced by shaking a square of sheet iron), and finally a rain slide is thrown on the scene, the sound of the storm being well represented by

pouring some barley into an appropriate vessel, and a flash or two of lightning being still continued. Finally these effects are changed for one showing the moon emerging from behind a cloud. This must be done very gradually; and while the moon slide is thus worked the scene is gradually dissolved into a bright moonlight scene, with the light upon the water. After a few moments a snow slide is put in; and when this has fallen for a few seconds, the landscape is again dissolved into a winter scene, with snow upon the landscape and ice upon the pond, on which skaters execute their gliding movements; or this last may be done when the scene is again changed to a night and bonfire effect with lights in the mill windows."

This glowing description certainly indicates an advance beyond the state of things suggested by a definition in an old dictionary:—"The magic lantern is a small optical instrument which shows, by a gloomy light on a wall, monsters so hideous that those who are ignorant of the secret believe it to be performed by magic."

Such dissolving and mechanical effects as the one described could be produced only by considerable skill in the preparation of the slides, good sets of which cost many pounds. It was difficult, too, to centre all the slides accurately on the disc, and at least two operators were required to manipulate the slides and lanterns, with an additional one to produce the incidental noises.

For a long time the usual method of producing a hand-drawn slide was as follows:—The outline was first drawn on a sheet of paper. Over this was laid a piece of clean glass, on which the outline was traced in black or colour, with a fine brush. When this was dry, transparent oil-colours were applied, dabbed smooth in some parts with the tip of the finger—pumice-stoned smooth for the purpose—and wiped or scraped away in other parts. The slide was then baked for hours to dry this first painting, after which further work was done, until with alternate baking and colouring, the slide was finished. Many of the better class slides were solidly painted, without any definite outline at all.

It was not till the middle of the nineteenth century that the first whispers were heard as to the possibility of photography being applied to the production of lantern slides.

The photographic process to which Daguerre's name was given employed a plate of silvered copper for producing the image, and the Calotype process of Fox Talbot gave both negatives and prints on paper. It was manifestly impossible to use opaque or even semi-opaque media for lantern projection. In 1848 Niépce de St. Victor published his method of producing photographs on glass plates coated with albumen and sensitized with silver, and this process was rapidly improved by Blanquart Everard and Le Gray. In 1851 Scott Archer evolved the wet-collodion process for both negatives and positives.

It is evident that by this time there were two photographic processes suitable for the production of slides for projection, yet in Hunt's 1853 edition of his handbook on photography there is no mention of such slides, and in 1854 a member of the Liverpool Society said that collodion transparencies would be useless for the lantern, while another member added that they were too transparent.

The "Manchester Guardian," however, records that in the autumn of 1853 Mr. J. B. Dancer gave an exhibition at his house of what was was called "microscopic photography," which it is clear was nothing but the projection of photographic transparencies. Amongst his audience was Mr. Hutchings, the secretary of the Mechanics' Institution of Manchester, and during the winter he arranged for the exhibition at the Institution of both photographic and hand-coloured slides. The latter were pronounced to be markedly superior. The following year the methods of slide-making and limelight projection were so improved that large audiences were attracted to the regular exhibitions, and the Institution made a yearly profit of about a thousand pounds. In 1859 "Chamber's Journal" described how 20-ft. pictures were being shown at the Institution to hundreds of people, and suggested the value of such exhibitions for educational purposes. Inquiries as to the methods employed poured into the Institution from all quarters, and the year 1860 may be named as the approximate date which saw the photographic lantern slide firmly established. Thus did Manchester show the way to the Polytechnic.

In the 1856 edition of Winsor and Newton's manual on "The Art of Transparent Painting on Glass," it says in the introduction: "In the use of painting on glass photography will be found an invaluable aid. Photographic pictures themselves may be thrown on to the disc; but the advantages and facilities which photography presents in obtaining accurate views of sites, buildings and objects, cannot be too highly estimated."

Thomas Sutton, the editor of "Photographic Notes," writing in February, 1856, suggests projection of two stereoscopic transparencies by two lanterns, or that an artist might make tracings from such, and colour them. (Here, as in Winsor & Newton's book, is a distinct suggestion to use actual photographs.) Spectators were to have a pair of spectacle frames fitted with small vertical prisms, so as to displace both pictures sufficiently to make their central lines coincide, and form a single picture with stereoscopic effect.

In the same year, 1856, the experiment was tried at the Photographic Society of Glasgow, using Ferrier and Soulier's stereo slides. The viewing stereoscope was of Parisian make, and the spectators had to vary their distance according to the degree of enlargement.

It is interesting to find at such an early date the problem of optical stereoscopic projection was being investigated; but here a more important point arises. We must remember that a large proportion of early photographers used stereoscopic cameras, obtaining pairs of negatives each 3¼ inches square. When the first attempts were made at producing transparencies for the lantern, these were printed from one of the stereoscopic negatives; and I suggest that it was this fact that has given us our standard English lantern size of 3¼ inches square. The hand-made slides were of all sorts of sizes. Circles of 3 to 6 inches diameter were common, and some of the Polytechnic slides were 8 by 5 inches, and even larger.

In February, 1857, Mr. C. I. Burnett read a paper before the Photographic Society of Scotland in which he suggested some strange uses for the new photographic transparencies. "It may sound very odd to talk of smoke or vapour as a photographic canvas, but very startling effects might no doubt be produced by throwing the image from glass positives, placed in the magic lantern, on wreaths of smoke or vapours. Such an apparatus would have been quite a godsend to the conjurors of old, and might, even in our enlightened nineteenth century, prove invaluable to the explorer among savage tribes. To solitary explorers it would be no small advantage to be able to conjure about them at night such a host of ghastly protectors as this would enable them to exhibit to their watchful foes." As a matter of fact, this method of projecting ghosts, skeletons, and other cheerful subjects, had been tried long before, for I have seen in a work published in 1794 instructions for making a special smoke-box for the purpose.

Mr. Burnett had another brilliant idea: "Might not the images from glass positives be made available for the exhibition of scenery in our operas and theatrical performances in certain cases? We need hardly say how superior such scenery would be to much of what now accompanies our operatic and theatrical performances." This is certainly a scathing commentary. What must the scenery have been like

if the photographic transparencies of the 'fifties were an improvement on it? Had the views been projected from the front, it is obvious that the performers themselves would have been covered with the photograph; and if from the back, the light from the footlights would have counteracted that from the lantern.

After Mr. Burnett's paper there was an exhibition of 24 slides illustrating an expedition to Teneriffe. The lantern was fitted with what was known as a limeball light, and the screen used was only 6 feet square.

In September of the same year (1857) "Photographic Notes" published the following letter from Mr. John F. Dudgeon, of Glasgow: "I take what is termed a common negative plate, in the usual way, and from that negative plate I take another plate which is termed a transparency, because in looking through it you see the person or object as it is, or in short in its positive or real form. This transparent plate I may colour (with transparent colours, of course), or not, as I please. If not coloured, it gives to the picture on the white curtain, when exhibited in the magic lantern, nearly a pure white and black appearance. If painted according to the person or object taken upon the plate, the same is seen on the curtain or canvas. I next pass this plate through the part formed for it in the lantern (*i.e.*, between the gas-jet or lamp producing the light, and what is termed the bull's-eye), and the exact image of the plate so presented in the lantern is immediately transferred, so to speak, to the tight canvas or curtain."

Mr. Dudgeon was suggesting that this projection of a lantern slide, plain or coloured, would enable an artist to paint a portrait without compelling the sitter to pose to him for weeks. But the editor pointed out that the canvas would have to be semi-transparent; that the artist would have to sit behind it; and that he would not then have sufficient light to paint by. Thus are the glowing fires of suggestive geniuses extinguished by douches of editorial cold water.

At this time the albumen process was used for making transparencies for the lantern, and a hint as to its character may be gathered from a letter from Mr. J. Ross (of Ross & Thompson, Edinburgh) in 1857. "The eggs are beaten up with common salt, dissolved in water, saturated, 14 drops to each egg. When coated and dried, which is done in the usual way, dip in silver, 70 grains to the ounce of water; put in the dark till dry. Expose in the printing frame from one to three hours, in sunshine, according to the strength of the negative, and fix with hypo-sulphite; wash in the usual way."

The same process, but with more sensitive plates, is mentioned in the "Liverpool and Manchester Photographic Journal" of April 15, 1858, in answer to the following letter:—"Sir,—Can you favour me with an idea as to where I shall find the process for producing photographic magic lantern slides? Such, for instance, as the beautiful subjects exhibited lately at the Manchester Mechanics' Institution. Only a month or two back I found in the 'Journal' a notice that 'small transparent pictures make good lantern slides,' but I cannot find anywhere how to produce them. I believe architectural or landscape subjects are the best for slides, especially the former, and that portraits will not answer. Can you tell me the reason of this latter fact? Excuse the trouble; your valuable advice may make something out of A. Tyro." The editor replied: "Magic lantern slides may be produced precisely in the same way as the transparent positive stereographs, that is, by bringing the negative in direct contact with excited albumenised glass plates, exposed to diffused daylight for a few seconds, and subsequently developing in the same manner as for a negative. Instead of albumenised glass, the dry collodion process of Dr. Hill Norris, or the collodio-albumen of M. Taupenot, may be substituted with advantage, especially by the amateur. We do not agree in the proposition that portraits will not answer in the magic lantern."

We may note that the wet collodion process, invented by F. Scott Archer, was now being largely employed instead of albumen, mainly on account of its greater rapidity.

In an early number of the "Journal of the Photographic Society"—now "The Photographic Journal"—appear the following letter and reply:—Question: "How may one reprint from a glass negative on glass, so as to serve for the phantas-magoric lantern?"—Answer: "Probably the best means would be to take a positive copy on collodionised glass by means of Heilman's photographic pantograph. After this has been fixed and washed it is fit for a slider, showing, however, light and shade only; but it may then be coloured by hand in the ordinary way of painting lantern slides—that is, with transparent colours mixed with varnish" The grandiloquent name, Heilman's photogenic pantograph, signified nothing more than a fixed-focus camera for copying same size. Note, too that the word "slider," instead of "slide," was not uncommon at this period.

Printing by contact with wet collodion was naturally impossible; hence the use of the camera for copying. The collodion-coated, silver-sensitised plate had to be exposed as soon as it was prepared. There is a story of a gentleman who was about to expose such a plate when he was suddenly called away. His luncheon of sandwiches and India pale ale had just been brought in, and he poured a little of the ale on and off his plate once or twice. On his return he found the plate still in good condition, and thenceforth there were experiments with different brews of beer, and it became common to use also as preservatives such things as tea, coffee, raspberry vinegar, and oxymel, which was a boiled syrup prepared from honey, water, and vinegar.

Later on it was discovered that by certain additions, to prevent the collodion from becoming horny and brittle, it was possible to dry the plate and keep it for some time—a discovery that culminated in the well-known dry collodion plate of Dr. Hill-Norris. Still later, gelatine was introduced as a vehicle for the silver salts, and the modern dry-plate for both negatives and positives came into use. By employing both bromide and chloride of silver, separately or in combination, varieties of lantern plates were produced for giving black or brown tones by suitable exposure and development, and many other colours by various toning methods.

Returning for a moment to an earlier date, we find that in 1860 the plain photographic image was not always considered to be beyond improvement, as the following remarks indicate: "Delicate manipulation is necessary in the preparation of photographs to be used in the magic-lantern slides; they ought not to be heavy and opaque. Some subjects, such as florid Gothic buildings, are especially adapted for lantern slides: the details of the architecture break up the masses of colour, and produce an agreeable balance of light and shade. Other subjects require to be opened up with a etching-needle, and toned with colours to render them pleasant and effective. Any reasonable amount of labour is well bestowed in bringing a photograph into the best condition for exhibition on the screen."

Or again: "I have found the value of a photograph as a lantern slide to lie mainly in its exquisite outline and drawing, and only secondarily in its light and shade." Whereupon, accordingly, he proceeds to open it up with an etching-needle, and then colour it.

In January, 1863, Mr. Samuel Highley, F.G.S., read a paper at a meeting of the Photographic Society held at King's College, advocating the use of the photographic transparency for lantern slides in place of hand drawings, and mentioned that Messrs. Negretti & Zambra were the first in this country to put on sale for the lantern subjects of geographical and architectural interest. He suggested a

standard size of 3¼ inches square for slides, and proceeded to show some examples made with the microscope, and others copied from engravings. He was quite enthusiastic on the value of obtaining subjects from engravings, until in 1866 he was prosecuted and fined for infringing copyright. This probably converted him to the idea that it was better to obtain original subjects direct.

About this time there was a craze for adapting cameras for optical projection—with what success may be imagined; and many articles appeared giving directions for making home-made lanterns for showing the photographic slides to which so many were turning their attention. There was also a suggestion that a club should be formed for the exchange of photographic transparencies suitably mounted for the lantern.

A note in 1865, to the effect that "photographic transparencies are now steadily taking the place of the old class of painted slides for the magic lantern," suggests that it is time to pause and proceed to examine some actual slides, old and new. It is impossible to place them in chronological order, or to include more than a few types; and I should like to show first a few examples of wood-framed slides. These will not go into the ordinary carrier, which must be removed for the purpose; and when it is replaced we can glance hurriedly at some examples of plain and coloured slides of standard size.

W. L. F. WASTELL.

BROMOIL AND BROMOIL TRANSFER

(*Concluded from page* 725.)

Inking is the next process, and provided everything has been correctly done up to this point, should present no difficulty. First of all, squeeze a little ink (the hardest you have) about the size of a pea, on the palette knife and spread it as thinly as possible on the glass you are using as a palette. Then take the soaked print from the dish and place it on the plate glass provided for this purpose. While still wet, swab it firmly and evenly all over with a wad of cotton wool taking care that no grit or foreign body is on the surface: lay a piece of blotting paper over the print and squeegee lightly until all surface moisture is removed. Wipe away all moisture from the glass around the print, in order to avoid getting moisture on the brush, for, if this happens, not only will the ink refuse to take from the wet brush, but it will also remove the ink already deposited in spots. Take the largest brush and dab it lightly in the ink on the palette, holding the brush vertically and at about 2 inches from the top. Then tap the brush on the plain glass of the palette two or three times to even the distribution of the ink on the brush, and dab it lightly on the print, putting a slight pressure on the brush just as it touches the print. At no period should there be very much ink on the brush—it should only be on the very tips of the hairs. This dabbing motion, which I can only compare to the way an impatient man taps a pencil on his desk, should be continued till the ink has taken evenly all over the print and attains the depth desired. Practice soon makes the action automatic.

The chief point to remember is that it should always be gentle and as rapid as possible. The pressure that I mentioned should take place as the brush touches the print, should be the merest emphasis, and the dome shape of the brush will turn this into a dragging motion which deposits the ink. There should always be some ink on the brush except in the final stages, when it is sometimes desirable to go over the print with a clear brush to even up the result. If it is desired to remove ink, this is easily done by reversing the motion and making the emphasis of the stroke on the upward movement of the brush. This also tends to heighten the contrast.

As a rule it will be found that the hardest ink will take quite well, but occasionally it may be necessary to thin the ink a little; a small quantity of medium should be taken on the palette knife and thoroughly worked into the ink. It should be let down little by little till it will just take easily and no more. With some papers there is sometimes a little initial difficulty which goes with working, and before diluting the ink one should be quite sure that this is not the case. It is better, however, to use as hard an ink as possible, as the result is seldom clean when the ink has been softened at all, and medium should only be used when the print refuses to ink, unless, of course, it is desired to subdue insistent high lights, spots, and suchlike local alterations.

To heighten local lights a small, soft, pointed rubber may be used or a small clean brush will remove the ink if lightly hopped or bounced on the print. Hairs from the brush, bits of grit, etc., on the print should not be moved until the ink is dry, which will be in about two or three days. They may then be rubbed off or lifted with a sharp knife. High-lights may then be cleaned up with a soft rubber and spots removed. It is safer and easier to leave anything in the nature of retouching till the print is thoroughly dry.

The beginner should, however, aim first of all at producing an exact replica of the bromide print, for until he can do this he is hardly in a position to use control—he is controlled by the process, and although he may fluke an effective result, he will never know how he produced it nor will he be able to repeat.

It should be realised that this process depends upon two very unstable factors—gelatine and a chromic salt. My knowledge of chemistry is elementary, but I am informed that gelatine is still a subject for research, and until its properties are definitely established the process must remain uncertain. I can, therefore, only mention some of the difficulties I have met and overcome, and where I think I have been able to trace a cause, it is quite possible that chemists may point to other things which may give the same result or dispute my conclusions in entirety. As far as actual practice is concerned, however, I may say that I have proved all my remedies to my own satisfaction, and where I assume a cause, whilst it may be open to argument, the remedy I put forward has been effective, although it may act in a different manner to that which I imagine.

It should particularly be mentioned that in tracing faults or experimenting only *one* alteration should be made at a time, for it is obvious that if two things are tried it is impossible to say which is responsible for the difference.

The first difficulty that is usually met with is a refusal of the ink to take. Over-soaking, soaking-in and the use of solutions at too high a temperature, too large a proportion of bichromate in the bleacher, too hard an ink, moisture on the surface of the print, too lengthy bleaching, insufficient bleaching, and the omission to swab the print before inking will all cause this condition, and to deal with each in order:—Over-soaking and soaking at too high a temperature (both amount to the same thing) are indicated by an excessive relief, occasionally by blisters and sometimes, but very seldom, by the gelatine in the high-lights reticulating or coming off in little bits. Except in the latter case, there are two remedies—one is to dry and re-soak either at a lower temperature for the same time, or at the same temperature for a shorter time. The second is to let down or dilute the ink. The former is preferable, as there is less risk of getting the print oversoaked.

If the ink takes a little but will not give sufficient depth the ink is too hard and should be let down, little by little, till it will just take sufficiently. If there is too much bichromate in the bleacher, the print acts in much the same way as if over-soaked, but with these differences. If the ink be thinned so that it will take there will be no gradation in the shadows or high-lights, the ink will not stay on the print with repeated brushwork, and where it does it will be grainy in texture and poor in colour. There is no remedy. A similar state of things, though not so bad, is produced by leaving the print in the bleacher too long, but in most cases longer soaking will do much towards giving a passable print.

Too little bichromate is shown by a general reluctance to ink; if it takes at all it is patchy and easily removed, and there is no gradation anywhere except perhaps in the lighter portions of the print and it may not show there. A print in this condition is hopeless, though if it is not very much at fault thinner ink may produce a result.

If one forgets to swab the print it may be cleaned with petrol on cotton wool, dried, and re-soaked, but wherever petrol is used on a print, care should be taken to see that it has all evaporated before wetting the print again or a very muddy print will result.

It also happens that, instead of the ink refusing to take, it takes all over—on shadows and high-lights alike. This is most likely due to insufficient soaking or soaking at too low a temperature, but may be due to a too soft ink, too little time or too much in the bleaching solution, and to the use of stale paper.

If it is due to incomplete soaking or the temperature is too low—indicated by a lack of relief—clean with petrol and re-soak as above at a higher temperature for the same time or a longer time at the same temperature.

It is not very often that a print that has been too long in the bleacher takes ink indiscriminately, but if it does occur it may be deduced from the fact that whilst the whole print is too dark in tone, the quality is good except in the high-lights where the colour of the ink is poor, and if a black ink has been used, the lights will be brownish instead of grey. The lights, too, will take ink more readily than the shadows, giving what is known as partial reversal. This may be overcome by continued inking. Reversal itself is dealt with further on. There is no real remedy, but a longer soaking may give a lighter print.

Where the print is under-bleached, it usually takes the ink lightly, without regard to the image except in the lighter parts, and there it may not take at all, and is easily removed by continued dabbing as before-mentioned.

Too soft an ink is shown by the image being too dark all over with dirty lights and clogged-up shadows. The ink is difficult to remove by brushwork, and the whole thing has a muddy appearance. The print may be cleaned with petrol and re-soaked, a harder ink being used.

Stale paper sometimes both refuses to take or takes all over: in either case nothing can be done.

Reversal or partial reversal is a curious phenomenon that is sometimes met with, and no one appears to know how it arises. It can be cured, generally, by a thorough cleaning with petrol, drying, and re-soaking, and sometimes persistent inking will gradually remove it.

I have found definitely that it is due (1) to a stale bichromate solution being used, or (2) to the bromide prints not being thoroughly washed, and to (3) hypo and developer contamination, and also (4) to too great a proportion of potassium bichromate.

There may be other things which may cause reversal, but I have not been able to establish them definitely. Some fellow-workers have mentioned that they suspect working in a warm room during inking, but I have never been able to prove this, and think it more probable that one of the causes above-mentioned is responsible.

It is obvious from the foregoing that perfect cleanliness in working is essential, and the faults I have given indicate of themselves what precautions to take to do away with the nuisance of reversal.

A Bromoil sometimes works up well but the image is grainy and composed of minute dots that will not coalesce. This is generally due to a dirty brush or one with too much ink on it. The ink may be unsuitable, but as long as it is of the makes above mentioned it is very unlikely indeed.

Patches which ink up irregularly are sometimes noticed, and these may be due to several causes. If they are circular or semi-circular in shape they are most likely due to air bubbles in the first fixing, during bleaching or soaking. There is no remedy except retouching the finished print when dry, so care should be taken to use plenty of the various solutions and to see that the prints are always kept moving and under the surface.

If they are irregular in shape and lighter than their surroundings, they may be caused by the print not being covered in an even sweep in developing or bleaching; if they are darker than the rest of the print, they may be the result of soaking too many prints at a time, of sticking together in one or other of the baths, or possibly the victims of such a silly practice as pouring hot water into a dish containing prints in order to raise the temperature. In this case some of the hot water is bound to reach the prints without being cooled by the water already contained, and markings are obviously inevitable.

Temperature should always be adjusted before the prints are put in, and the dish well rocked before and after insertion. Marks may also be caused by insufficient bleaching, incomplete first fixing, not enough soaking or washing. The symptoms and remedies have been mentioned above.

Very occasionally a print will refuse to bleach, and the most likely cause is the presence of hypo in the emulsion, or the use of acid hypo in the first fixing, or the paper may be utterly unsuitable. The bleacher may be exhausted, and in the latter case only is there any hope of making a decent print; it should be removed from the dish and placed in running water till the yellow stain has gone, and should then be placed in fresh bleacher, proceeding afterwards as usual.

Other irregular markings are due to such things as touching or rubbing the surface of the print with the fingers during any of the operations, and abrasions due to improper handling, such as pulling prints out of a dish by one corner or grazing them on the edge of the dish in removing from dishes or tanks.

This process is a charming and elusive one—it is difficult—but the results, even if uncertain, are of such a quality that no other process can equal. It is not a process for the novice, and until a worker is able to turn out bromide prints of quality with absolute certainty, it is no use thinking of Bromoil, for whilst it requires a considerable amount of technique to produce a good bromide, it is nothing to that that is necessary to make a good Bromoil. Similarly, Bromoil must be mastered before proceeding to transfer.

Transfer is a process that is based on Bromoil. Up to the point of inking the procedure is similar, but thereafter there are differences.

Both bromide and Bromoil may be stronger in contrast as the print eventually produced is softer than the Bromoil.

In quality the result resembles an etching; which is not surprising when one considers that the paper and inks employed are identical, and, in addition, it has the advantage over etchings in the rendering of gradation and in the faithful depiction of half-tones, usually lacking even in the best of etchings.

Bromide papers suitable are:—

Kodak "Velvet."
Barnet "Smooth Ordinary."
Barnet "Semi-Matt Card."
Kodak "Royal."

The time of soaking and the temperature have been given

above in the Bromoil section and are calculated so as to bring the print to such a condition that it will take the ordinary stiff ink used without dilution.

It is important that it should do this, as if the ink is diluted it is reluctant to transfer. The fact that all the ink put on the print has to come off again must be kept in mind from the beginning. Inking should be as light and rapid as possible. A 15 × 12 print should not take much more than 30 minutes to ink, including faking.

Now, assuming that the print is ready on the glass slab, take a very small amount of pigment on the brush, much less than for Bromoil, and lightly dab it all over in order to see where the lights and shadows are. Ink up the lights first, then the half-tones, and lastly the shadows. The reason for proceeding in this order is that the darks are most reluctant to transfer while the lights and half-tones do so easily. The longer the darks are left before transferring the more difficult it is to transfer them.

Do not work the print to smooth down the ink more than is barely necessary, and leave all faking to the end.

If medium is necessary to thin the ink in order to darken obtrusive lights it may be sparingly used now. It is advisable that the effect desired should be memorised beforehand and kept in view all the time, so that no time is wasted thinking what to do and how to do it at the end.

Inking being complete, the Bromoil is ready for transfer. My press is an ordinary kitchen mangle—it serves as well as an etching press or the special machines made for the purpose.

Any paper made for etching is usually suitable as long as it is tough enough to hold together when the Bromoil is pulled away from it. It should be fairly thick and absorb water easily, and should not have much, if any, size in its composition. Hand-made papers are usually best.

The transfer paper requires to be in a damp, but not wet, condition when the operation of transfer takes place. At some time previous to inking the Bromoil—an hour is sufficient—take such a number of sheets of transfer paper as are likely to be wanted and soak them for not less than five minutes in water; take them out one by one, allow them to drain a little, and place each between sheets of blotting paper, i.e., put a sheet of blotting on a board, then a sheet of transfer paper, then another piece of blotting, another transfer paper, and so on. In half an hour they will be ready for use, and will remain so for some hours unless the room is unduly warm and dry.

A carrier to take the print and transfer paper should be made ready beforehand. I use a piece of 3-ply wood rather larger than the largest transfer paper used. On this I place one or two pieces of smooth card (simply to make up the thickness and increase the pressure), then the Bromoil, and on top the transfer paper, and over that a piece of printers' blanket and a thin card. The whole is passed through the mangle and afterwards separated.

In detail, after inking is finished the Bromoil is put on top of the second card of the carrier, is masked with strips of thin paper to give a straight and clean edge, the transfer paper is placed in position on top, over this the piece of printers' blanket, and then a thin piece of card, taking care that everything is quite flat or creases will result. The latter card is only to protect the print from any roughness in the roller.

Now screw up the mangle as far as it will go—it is practically impossible to get too much pressure, and pass the whole sandwich through and back. Take off the top card and blanket and turn the Bromoil print and transfer over—they will be sticking together—and mark the corners in order to get correct register in case the transfer wants more depth anywhere; lift the Bromoil print by one corner and carefully and slowly peel it from the transfer paper, watching the transfer and Bromoil to see that all the ink has come off the Bromoil. If a small patch is seen to be remaining on the Bromoil it may be replaced—taking care that it remains in register—the blanket and card put on top, and the whole put through the mangle again. Occasionally it may be necessary to make a pad of folded newspaper to increase the pressure locally where the ink has failed to transfer.

Sometimes it is sufficient to turn the print and paper halfway round and put through again.

Having parted the Bromoil and transfer, the latter should be examined to see if it is strong enough. It is far better to get the right strength with one inking, if possible, but if there is not enough depth in the transfer, the Bromoil may be re-soaked in cold water, say for 10 to 20 minutes, and re-inked only in those places that require more strength. Put the print in register on the transfer and put through the mangle again. Repeat if necessary but don't overdo it, as the transfer paper will be drying all the time and the gelatine of the Bromoil will probably get tacky, in which condition it will pull off the surface of the transfer paper.

If another transfer is required the Bromoil may be cleaned with petrol, dried and re-soaked as before mentioned, re-inked and re-transferred.

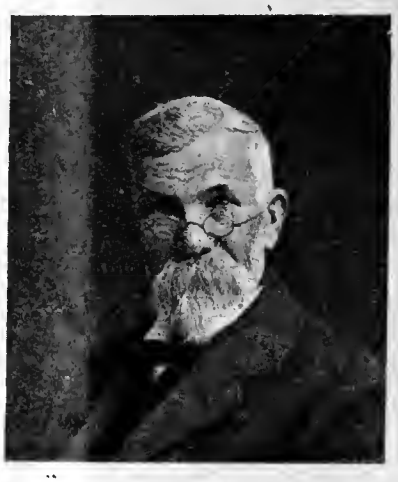
This may be repeated till the surface of the Bromoil gives out—it is possible to get as many as six or seven transfers from the one bromide print, but the quality deteriorates rapidly after the second. Re-touching may be done to almost any extent when the transfer is dry. Carbon pencils, Bromoil ink diluted with paraffin, water colours, chalks, india-rubber, and a sharp knife may be used as the skill and fancy of the operator directs.

Care is essential throughout, but both these processes are so absorbing that once success has been achieved it is most rare that any worker deserts them for other processes, and if this article is the means of helping any fellow-pictorialist, it will have served its purpose and fulfilled the intention of the writer.

CHRIS. J. SYMES.

DEATH OF MR. JOHN TERRAS.

WE regret to record the death, in his seventy-ninth year, of Mr. John Terras, who for sixty years has followed the profession of portrait photographer, and for a large part of that period had been the head of the business in Markinch, Fife. Mr. Terras, who was a friend of Valentine Blanchard's, began photography at a time



The late Mr. John Terras.

when his mechanical ingenuity found a useful application in the construction of his own apparatus. Throughout his business career he was constantly at work on the improvement of technical processes, and a tribute to his personal skill exists in the twenty-seven awards made to his work. He was also a most enthusiastic botanist and closely familiar with the plant life of the Lomond Hills. During the period of the war he continued his business, despite his advanced age, whilst his two sons, James and Peter, were in the R.A.F. It was, no doubt, the pressure of these circumstances which broke down his health. He is survived by his widow and two sons, to whom sympathy will be extended in their bereavement. The business will be carried on as hitherto by his sons.

FORTHCOMING EXHIBITIONS.

December 9 to 31.—Rochdale Amateur Photographic Society. Particulars from the Hon. Secretary, W. Lord, 10, Derwent Street, Rochdale.

1923.

February 5 to March 3.—Northern Photographic Exhibition, City Art Gallery, Manchester. Latest date for entries, January 12. Particulars from the Hon. Exhibition Secretary, Walter Johnson, 30, Hartington Road, Chorlton-cum-Hardy, Manchester.

February 10 to 24.—Scottish Photographic Salon. Particulars from the Secretary, George A. Ross, Northfield Cottage, Brechin.

March 1 to 8.—Birmingham Photographic Society. Latest date for entries, February 15. Particulars from the Hon. Secretary. J. E. Breeze, 178, Broad Street, Birmingham.

March 2 to 31.—Pittsburgh Salon of Photography. Latest date, February 5. Secretary, Charles K. Archer, 1,412 Carnegie Building, Pittsburgh, Pa., U.S.A.

March 13 to 16.—Exeter and West of England Photographic Exhibition. Particulars from the Hon. Secretary, R. W. J. Norton, 4, Buddle Park, St. Thomas, Exeter.

March 15 to 24.—Photographic Fair, Holland Park Hall. Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications November 20 to 25:—

PLATE HOLDERS.—No. 31,778. Photographic plate and film holders. R. C. Matson.

COMPOSITE PHOTOGRAPH.—No. 31,825. Production or exhibition of composite photographs. A. Bennett, Move-o-graphs, Ltd., and A. E. Walsham.

APPARATUS.—No. 32,200. Machine for printing positive films. A. L. V. C. Debrie.

CINEMATOGRAPHY.—No. 32,142. Manufacture of announcement slides for cinemas, etc. J. W. C. Basnett.

CINEMATOGRAPHY. — No. 31,774. Treating cinematographic films. Pathé Cinema, Anciens Etablissements, Pathé Frères.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

HARDENED GELATINE PRINTING SURFACES.—No. 187,638 (April 18, 1921).—The invention describes the production and use of a transfer printing plate, which can be employed either for the dye or ink contact transfer process, and is applicable to monochromatic, polychromatic or natural-colour photography, both in "still" and motion picture photography. The term "colour" is intended to include "black," which sometimes technically is designated as an absence of colour.

A printing surface prepared according to the invention when treated with a dye, ink, or other colouring matter, will absorb or take up the colouring matter within a few seconds, thus differing from dye processes, among other reasons, for the fact that these require about six minutes for the absorption of the dye. When thus treated and placed in contact with a substance which is to carry the final reproduction, such as a gelatine surface, it will give up its colouring matter practically instantaneously and produce an exact and perfect reproduction. Although the saving of time and the superior results obtainable in still photography are important, this speedy result is of prime importance in the production of motion pictures, as the diffusion of dye or colour is imperceptible even when the picture is enlarged twenty-five diameters

The invention describes a method of forming a transfer printing plate by hardening parts of a photographic positive, according to the extent that they have been acted on by light, by a hardening agent and a controlling agent. The invention also consists in one form of the above method in which the positive is undeveloped before hardening, the hardening being effected during development. In another form the positive is developed before hardening, the developed positive being converted into an appropriately surfaced printing plate by potassium bichromate and sulphuric acid. The invention also consists in a modified process in which the positive printing record is formed directly from the negative on the same plate by partial development followed by exposure to light and further development. By way of example a positive is prepared from the desired negative by means of a sensitive emulsion such as a silver salt emulsion, which is exposed to the action of light through a negative. The silver salt emulsion may be carried or mounted on any desired support, either opaque, translucent, or transparent, but preferably is mounted on a transparent carrier such as glass or a cellulose base, in order that the silver salt emulsion may be exposed through its transparent carrier.

The exposed emulsion is treated by a developing solution containing a hardening or tanning agent, which renders insoluble the exposed parts of the emulsion. The unhardened or soluble portions may be removed by melting with warm water. In some kinds of reproduction the soluble portions will be removed, and in other kinds of reproduction the soluble portions will not be removed. Dyes and inks generally require different treatment. In all cases, however, the print is made from the selectively hardened parts of a positive printing surface. A sample formula for a developing solution for an emulsion exposed through its transparent carrier and containing a hardening or tanning agent is as follows:—

Water	8½ ozs.
Pyrogallic acid	11 grs.
Metol	9 grs.
Potassium bromide	4 grs.
Sodium carbonate	200 grs.
Sodium sulphite	40 to 60 grs.

In the above formula the hardening or tanning agent is pyrogallic acid, and the controlling and limiting agent is sodium sulphite. Potassium bromide also has a certain controlling and limiting effect. The main difference between the above formula and standard developing formulæ is in the amount of sodium sulphite used. In standard formulæ the amount of sodium sulphite is greatly in excess of the amount used in the above formula, and the tanning or hardening effect of the pyrogallic acid is entirely neutralised or overcome. In the given formula the sodium sulphite controlls and limits the hardening effect of the pyrogallol. The unhardened portions may then be removed if desired by placing the emulsion in warm water, which causes the unhardened or soluble portions to soften and melt away, so that the hardened emulsion alone will remain in the form of extremely minute, individual protuberances which are distributed and grouped irregularly so as to represent the photographic light and shade. When an emulsion is exposed through its transparent carrier, however, certain difficulties are encountered, unless the printing surface is very thin and lies adjacent the transparent carrier. As an ordinary commercial sensitive emulsion usually is in excess of one-thousandth of an inch in thickness, it is evident that it is likely to be penetrated deeply by the light to which it is exposed, particularly in the shadows. The resultant printing surface after treatment will have a ton thick printing surface in those portions which have been thus deeply penetrated. It is very difficult to get the darker portions of a negative recorded properly without having the lighter portions of a negative too heavy. In order to overcome these disadvantages, it was discovered that excellent results may be obtained by using an emulsion coloured with a colour which is complementary to the exposure light. When applied to photographic printing from a negative the colour will be complementary to the printing light, which generally is obtained from an incandescent electric lamp giving out blue rays. Naphthol yellow or its colour equivalent, in an aqueous solution, ten gms. of naphthol yellow to one ounce of water, will give satisfactory results. Excellent results may also be obtained by the use of a printing light complementary in colour to the natural colour of the sensitive emulsion, which may be described as of a slightly yellowish green. Such a light can be found in the highest visible violet rays of the spectrum. An arc lamp using blue flame carbons, or a mercury vapour lamp, will give satis-

New Materials.

CORRUGATED REFLECTORS.—The Westminster Engineering Co., Ltd., Victoria Road, Willesden Junction, London, N.W.10, send us a sample of a new corrugated reflecting material of their manufacture, which is giving much satisfaction in cinematograph film studios. The material has the appearance of ordinary corrugated wrapping-paper, covered on its surface by a highly-polished metallic coating. Thus the reflecting material is very flexible, and may be bent into any shape or fitted in any position. It is certainly of high reflecting power, and, from the small sample we have before us, we should say gives a softened reflection owing to the many corrugations of its surface. The material has been tested by several well-known portrait photographers in the studio, who report that it is very satisfactory as a powerful yet diffusing reflector of day or artificial light. As a reflector for half-watt lamps it should prove very useful, and being flexible could be easily fixed to any type of studio lamp fitting. The material is supplied in rolls 44 inches wide, but can be used wider than this if necessary, as it may be mounted upon wooden frames and a join made. In this manner reflecting surfaces of any dimensions are possible, and may be shaped to suit the conditions under which they are to be used. Prices are obtainable from the Westminster Engineering Co., who will be pleased to send a small sample of the material to any bona-fide professional photographer.

COLOUR PRINTS FOR PHOTOGRAPHERS.—There is no doubt that particularly at the Christmas season many photographers could do business in attractive colour prints, such as are largely sold by stationers, and at the print shops proper. Messrs. John Harrap & Son, 3, Holborn Buildings, Holborn Bars, London, E.C.1, send us some specimens of the prints which they supply for this class of business. They are of attractive landscape, seascape, and other subjects, to retail at 2s. each, and subject to a very liberal discount. Messrs. Harrap are just now making a special offer of 20 copies, all of different subjects, at the price of 21s., carriage paid, by way of inducement to photographers to test the profitable results, which follow the display of goods of this description to their regular customers.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SUNDAY, DECEMBER 10.

United Stereoscopic Society. "Architectural Photography." A. H. Page.

MONDAY, DECEMBER 11.

Bradford Phot. Soc. "A Naturalist in Holland." G. A. Booth.
City of London and Cripplegate P.S. "Lantern Slide Making." A. H. Redman.
Dewsbury P.S. "Candlelight Photography." H. A. Parkinson.
Glasgow and West of Scotland A.P. Assoc. Autochrome and Print Show.
Kidderminster and District P.S. "A.P. and P." Prize Slides.
Kinning Park Co-op. Soc. Camera Club. Lantern Slide Making.
Southampton C.C. "Winchelsea and Rye." Algernon Brooker.
Wallasey Amateur P.S. "Ensign Popular Cameras." Messrs. Houghtons, Ltd.
Walsall Phot. Soc. "My Holiday Rambles, and a Chat on Old Inns." F. S. Ellis.
Willesden Phot Soc. "The Way of the Lovely Sky." Capt. A. G. Buckham.

TUESDAY, DECEMBER 12.

Royal Photographic Society. 1. "Description of the 'N.S.' Kinematograph Camera." A. S. Newman. 2. "The Factors which Determine Gamma Infinity." G. I. Higson and F. C. Toy.
Birmingham Phot. Soc. "Psychic Photography." Fred Barlow.
Bournemouth Camera Club. Lantern Slide Competition.
Cambridge and District Phot. Club. "Head Hunters of Borneo." Dr. A. C. Haddon.
Exeter Camera Club. Exhibition of 1921 R.P.S. Affiliation Competition Prints.
Hackney P.S. "Psychology in the Studio." C. Pollard Crowther.
Halifax Scientific Soc. Members' Prints.
Leeds P.S. "Caves and Crags of the Peak." J. W. Puttrell.
Liverpool A.P. Assoc. "Bromoil and Bromoil Transfer." C. J. Symes.
Maidstone and District P.S. "Pinhole Photography." J. E. Austin.
Manchester Amateur Phot. Soc. Exhibition Discussion.
Morley A.P.S. "A Chat on Colour Photography." W. Scruton.
Portsmouth Camera Club. "A Trip to Paris via Newhaven, Dieppe and Rouen." A. Brooker.
Slough and District Y.M.C.A. Phot. Club. "Art with a small 'a'." J. Vacy Lyle.
South Glasgow C.C. Open Night—Club Debate.
Wolverhampton Phot. Soc. "Enlarging." A. H. Yelland.

WEDNESDAY, DECEMBER 13.

Birkenhead Phot. Assoc. Social Evening.
Borough Polytechnic P.S. Second Lantern Slide Competition.
Bristol Phot. Club. "About Bristol with a Camera." H. C. Leat.
Croydon Camera Club. "The Man behind the Camera." C. P. Crowther.
Forest Hill and Sydenham Phot. Soc. Gaslight Papers.
Kodak Staff Phot. Soc. "What Photography does in X-ray Work." N. E. Luboshey.
Partick Camera Club. Joint Meeting. Partick C.C. Visit Dennistoun A.P.A.
Photomicrographic Society. "Road Metals." E. M. Bull.
South Suburban and Catford Phot. Socs. "Light and Colour." L. J. Hibbert.

THURSDAY, DECEMBER 14.

Coatbridge Phot. Assoc. "The Sanderson Camera." Messrs. Houghtons, Ltd.
Edge Hill Camera Club. "Paget Colour Process." A.P.M., Ltd.
Gateshead and District C.C. "Colour Bromoil." H. P. Becke.
Hammersmith Hampshire House P.S. "Sussex and the South Downs." Jas. Grice.
Letchworth Camera Club. "Photographic Dodges." Members.
Liverpool A.P.A. "Two Cities of Bavaria." W. A. Clarke.
North Middlesex P.S. "Warm Tones on Alpha Plates." H. V. Abbott.
Richmond Camera Club. "Bromide Enlarging." A Member
Rochdale Phot. Soc. "On the Broadlands with a Camera." E. Horsfall.
The Camera Club (London). "Florence and some Cities of the Etruscan League." Walter Sanderson.
Wimbledon and District C.C. "Wild Life in a British Forest." F. Martin Duncan.

FRIDAY, DECEMBER 15.

Royal Photographic Society. Discussion: Panchromatics.
Wakefield Phot. Soc. "Principles of Pictorial Photography." Fred Thorne.

SATURDAY, DECEMBER 16.

Partick Camera Club. Whist Drive.

ROYAL PHOTOGRAPHIC SOCIETY.

At the meeting held on December 1 last a paper by Mr. L. E. Banfield, on "Summer Photography in India," was read by his brother, Mr. A. C. Banfield. The author, who has lived in India for many years, dwelt upon the many difficulties of practising photography in a country where often the shade temperature is well over 100. He had a well-fitted dark-room, measuring 12 by 8 ft. and 10 ft. high, but its one drawback was its temperature, which very frequently was 104 F. The town supply of tap water was available only for two hours, morning and evening, and in midsummer would have a temperature of 110 F. when first turned on, falling, perhaps, after a little while to about 80. Therefore, water had to be previously cooled by storing it in a few of the 10-gallon earthenware porous jars, known as "mutkas." The drawback to this method of cooling water was that mosquitos in countless thousands clung to the sides of the jars, and would begin their operations as soon as the photographer shut the dark-room door. Application to the body of an essential oil, such as citron, spike or lavender, would give respite for a time, but even this measure was not the only one which had to be taken before work could be begun. It was necessary to make sure that the room was free from snakes. Scorpions were such frequent visitors that Mr. Banfield kept a piece of plank specially at hand for flattening them.

For getting the developing and other solutions to a working temperature a large bath full of water was cooled with ice, and all the tanks of solution, including the fixing tank, kept in this cooled water. After developing and fixing, films were treated in 10 per cent. formaline solution for 20 minutes, after which, for washing, they might be risked in the tap water, if it happened to be running.

Drying the films presented equally serious difficulties, owing to the eating of the gelatine by little fish ants, which ploughed a way across the wet film, like skiers on snow.

Mr. Banfield strongly urged that the difficulties of photo-

graphers in the Indian summer should be more thoroughly considered than they had been. The requirement was some hardening agent which could be applied to the films before development. Hardening after development was almost useless, because the temperature of the dark-room might be anything up to 120 deg. F., and the moment the cage of film was lifted from the developer the hot air of the room began to exert its fatal effects, so that if there was the delay of a second or two in transferring the film into the next solution, the emulsion might run into a mass of jelly. Mr. Banfield had tried every hardening agent, without finding one which gave him satisfaction. Despite these difficulties, there was an enormous attraction in using a camera among the innumerable scenes of Indian town and landscape, but civilisation was changing the customs and costumes of Indian natives, and, therefore, the need for pictorial records, particularly of figure studies, deserved to be strongly emphasised before the opportunity for making them had passed.

The paper aroused an active discussion, in which Messrs. W. B. Ferguson, N. E. Luboshey, and T. H. B. Scott took part. A hearty vote of thanks was accorded to the author and reader of the paper.

Meeting held Tuesday, December 5, under the control of the Pictorial Group, the president, Mr. W. L. F. Wastell, in the chair.

Mr. C. Lewis Hind delivered a lecture, entitled, "The Lesson of Photography," before a large and distinguished audience. Mr. Lewis Hind said he spoke, not as a photographer, because he had never taken a photograph, but as a lover of art in all its forms. The painter's point of view often made him angry, and the advice of some painter friends to "rub it in" to the photographers at this meeting did not find favour in the lecturer's mind. The so-called feud, which was at one time assumed to exist between photographers and painters, was now quite a myth, said the lecturer, as the true artist, whatever his medium may be, was the man who reproduced the essential and repelled the unessential. The often debated point, "Is photography an art?" depends entirely upon the man. Photographers may be artists every bit as much as the painter, while all painters were not artists. It had also been argued that the so-called faking or improving of negatives should not be encouraged, but this, said the lecturer, was nonsense. It did not matter what means the worker used so long as the result justified those means, and any tricks may be adopted providing the effect was obtained. Turner once used the soot from a chimney-back to produce an effect in one of his works, said Mr. Hind, and so, to-day, painters use mixtures of pigments and mediums to produce the desired result. The lesson of photography was explained by the lecturer in the fact that as photographers go on, the more and more will they annex representation, while the more painters go on the less will they annex representation.

The field of representation will, in future, be held by the camera, which can portray the true representation of a subject far better than the painter. Referring to the prints upon the exhibition walls in the room (architectural studies by Mr. Fredk. H. Evans), the lecturer said no painter would give results such as these. The painter would give his own view, while the photographer renders the view as it really is, and as other people may see it. Genius, said the lecturer, was above the rules of which he spoke, and could not be considered in an argument of this kind. Speaking of the reproduction of carving by photography or by the painter, Mr. Lewis Hind said the sculptor would prefer the work of the camera, for here he would have true representation, and not the addition of other personalities. The old masters of painting would be impressed by present-day photography, every bit as much as present-day photography was influenced by the old masters, and was now copying their vision. The lecturer then referred at some length to the work of Alfred Stieglitz, who, he said, was a camera artist of the highest degree. The whole future of true reproduction was in the hands of photography, said Mr. Hind; colour-photography and the cinema, showing how science was advancing, while the wonderful photographs of sports, shown from time to time in the papers, were types of representation which the painter had never achieved.

In the discussion which followed, Mr. Child Bayley said he was pleased to hear the lecturer mention Mr. Alfred Stieglitz, a worker whose art would some day be truly appreciated. Upon the proposition of Mr. J. Dudley Johnston, a hearty vote of thanks was accorded the lecturer for his able discourse.

At the conclusion of the lecture two exhibitions of photographs were declared open. Mr. F. C. Tilney, in referring to the work of Dr. White, in the ground floor exhibition room, said this was a collection of prints made by this eminent worker when he was about 24 years of age, or between the years 1855-1857.

Mr. F. H. Evans then made a few remarks in reference to his pictures of Westminster Abbey, and the meeting ended by the showing of a number of excellent lantern slides upon the screen.

CROYDON CAMERA CLUB.

The announcement in the syllabus that Mr. J. M. Sellors would lecture on "The Negative and the Bromide Paper: Common-sense Applied to Exposure," ill-prepared his audience for the large amount of organised common-sense it had to absorb last week. The previous week members had experienced a fair dose at the hands of Mr. C. M. Thomas, but this was soothing syrup compared to the administrations of the redoubtable honorary secretary, who must have been busy preparing his lecture for months past.

In addition to making lantern-slides, much apparatus, and tests of scales of gradation of over 100 varieties of bromide papers, four dozen beautifully made slide-rules, with two moveable scales, were designed, constructed, and distributed. They involved 48 bromide enlargements; the cutting up of 400 pieces of cardboard dead true; dry mounting on face-plates; and assembling and fitting. Stupendous!

By its aid in conjunction with such every-day appliances as a calibrated wedge of H. and D. densities, and a Sanger-Shepherd density meter, the labour of making trial exposures on a slip of bromide paper, with its attendant anxieties and uncertainty as to the best exposure, either for contact prints, or enlargements and reductions is entirely eliminated. Owing to a virulent excess of material, the slide-rule was never reached, and by request its consideration was postponed to a vacant date at Christmas, when it should add materially to the festivity of the season. Having regard to this, much matter considered by him can be more conveniently dealt with then.

He started by referring to a somewhat similar system of exposure demonstrated over nine years ago, and he inquired whether any had adopted it, but obtained no answer in the affirmative, his audience now looking distinctly uneasy. "It is evident all intelligent members have since left the club," he bitterly commented, following with a suggestion that his proposed lecture should be abandoned in favour of ping-pong. The implements of the game not being on the premises, he was asked to get on.

Proceeding, he said that in his opinion scientists were well-meaning, and if they presented things in revolting fashion, in this respect they were no worse than medical men. It was a great mistake for the practical man to ignore scientists, for after all, they were fellow-creatures and displayed remarkable intelligence at times. Messrs. Hurter and Driffield were amateurs like themselves (no uncomplimentary inference intended) who set out to evolve order out of chaos, and were remarkably fitted for the job.

Next came a really luminous exposition of shadow, prism, and grease-spot photometers, all simple instruments, yet capable of accurate work. This was followed by an equally clear description of the calibrated wedge. Hopelessly behind time at this stage, a number of diagrams received far too brief attention. He finally wound up with a grievance against some manufacturers of bromide-paper, who inserted it in envelopes, apparently with a special machine guaranteed to prevent withdrawal without damage. The system adopted by the Kodak Company was, however, excellent.

In the discussion, Mr. H. P. C. Harpur said he was possessed of a fair vocabulary, but no words could express what he thought about the system advocated. Turning to the infinite, he portentiously added that the lecture, instead of awakening in him a wish to know more, had induced a strong desire to know considerably less. On the other hand, much appreciation for a lecture of unusual interest, one which must have involved an enormous amount of work, was expressed by many. Mr. J. W. Purkis said it was the finest scientific lecture on popular lines he had ever heard, and was an object lesson in showing that really useful research work could be done with simple apparatus. The lecturer had also interpretated in a very plain way the "shorthand" so largely used by scientists, and little understood by the general run of photographers.

ANGLO-HIBERNIAN TRADING CO., LTD.—Since the particulars given on page 730 in our issue of December 1 last were filed, the registered office of the company has been transferred, so we are informed, to 6, Great Arthur Street, Goswell Road, London, E.C.1.

New Materials.

Corrugated Reflectors. — The Westminster Engineering Co., Ltd., Victoria Road, Willesden Junction, London, N.W.10, send us a sample of a new corrugated reflecting material of their manufacture, which is giving much satisfaction in cinematograph film studios. The material has the appearance of ordinary corrugated wrapping-paper, covered on its surface by a highly-polished metallic coating. Thus the reflecting material is very flexible, and may be bent into any shape or fitted in any position. It is certainly of high reflecting power, and, from the small sample we have before us, we should say gives a softened reflection owing to the many corrugations of its surface. The material has been tested by several well-known portrait photographers in the studio, who report that it is very satisfactory as a powerful yet diffusing reflector of day or artificial light. As a reflector for half-watt lamps it should prove very useful, and being flexible could be easily fixed to any type of studio lamp fitting. The material is supplied in rolls 44 inches wide, but can be used wider than this if necessary, as it may be mounted upon wooden frames and a join made. In this manner reflecting surfaces of any dimensions are possible, and may be shaped to suit the conditions under which they are to be used. Prices are obtainable from the Westminster Engineering Co., who will be pleased to send a small sample of the material to any bona-fide professional photographer.

Colour Prints for Photographers.—There is no doubt that particularly at the Christmas season many photographers could do business in attractive colour prints, such as are largely sold by stationers, and at the print shops proper. Messrs. John Harrap & Son, 3, Holborn Buildings, Holborn Bars, London, E.C.1, send us some specimens of the prints which they supply for this class of business. They are of attractive landscape, seascape, and other subjects, to retail at 2s. each, and subject to a very liberal discount. Messrs. Harrap are just now making a special offer of 20 copies, all of different subjects, at the price of 21s., carriage paid, by way of inducement to photographers to test the profitable results, which follow the display of goods of this description to their regular customers.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Sunday, December 10.

United Stereoscopic Society. "Architectural Photography." A. H. Page.

Monday, December 11.

Bradford Phot. Soc. "A Naturalist in Holland." G. A. Booth.
City of London and Cripplegate P.S. "Lantern Slide Making." A. H. Redman.
Dewsbury P.S. "Candlelight Photography." H. A. Parkinson.
Glasgow and West of Scotland A.P. Assoc. Autochrome and Print Show.
Kidderminster and District P.S. "A.P. and P." Prize Slides.
Kinning Park Co-op. Soc. Camera Club. Lantern Slide Making.
Southampton C.C. "Winchelsea and Rye." Algernon Brooker.
Wallasey Amateur P.S. "Ensign Popular Cameras." Messrs. Houghtons, Ltd.
Walsall Phot. Soc. "My Holiday Rambles, and a Chat on Old Inns." F. S. Ellis.
Willesden Phot Soc. "The Way of the Lovely Sky." Capt. A. G. Buckham.

Tuesday, December 12.

Royal Photographic Society. 1. "Description of the 'N.S.' Kinematograph Camera." A. S. Newman. 2. "The Factors which Determine Gamma Infinity." G. I. Higson and F. C. Toy.
Birmingham Phot. Soc. "Psychic Photography." Fred Barlow.
Bournemouth Camera Club. Lantern Slide Competition.
Cambridge and District Phot. Club. "Head Hunters of Borneo." Dr. A. C. Haddon.
Exeter Camera Club. Exhibition of 1921 R.P.S. Affiliation Competition Prints.
Hackney P.S. "Psychology in the Studio." C. Pollard Crowther.
Halifax Scientific Soc. Members' Prints.
Leeds P.S. "Caves and Crags of the Peak." J. W. Puttrell.
Liverpool A.P. Assoc. "Bromoil and Bromoil Transfer." C. J. Symes.
Maidstone and District P.S. "Pinhole Photography." J. E. Austin.
Manchester Amateur Phot. Soc. Exhibition Discussion.
Morley A.P.S. "A Chat on Colour Photography." W. Scruton.
Portsmouth Camera Club. "A Trip to Paris via Newhaven, Dieppe and Rouen." A. Brooker.
Slough and District Y.M.C.A. Phot. Club. "Art with a small 'a'." J. Vacy Lyle.
South Glasgow C.C. Open Night—Club Debate.
Wolverhampton Phot. Soc. "Enlarging." A. H. Yelland.

Wednesday, December 13.

Birkenhead Phot. Assoc. Social Evening.
Borough Polytechnic P.S. Second Lantern Slide Competition.
Bristol Phot. Club. "About Bristol with a Camera." H. C. Leat.
Croydon Camera Club. "The Man behind the Camera." C. P. Crowther.
Forest Hill and Sydenham Phot. Soc. Gaslight Papers.
Kodak Staff Phot. Soc. "What Photography does in X-ray Work." N. E. Luboshey.
Partick Camera Club. Joint Meeting. Partick C.C. Visit Dennistoun A.P.A.
Photomicrographic Society. "Road Metals." E. M. Bull.
South Suburban and Catford Phot. Socs. "Light and Colour." L. J. Hibbert.

Thursday, December 14.

Coatbridge Phot. Assoc. "The Sanderson Camera." Messrs. Houghtons, Ltd.
Edge Hill Camera Club. "Paget Colour Process." A.P.M., Ltd.
Gateshead and District C.C. "Colour Bromoil." H. P. Becke.
Hammersmith Hampshire House P.S. "Sussex and the South Downs." Jas. Grice.
Letchworth Camera Club. "Photographic Dodges." Members.
Liverpool A.P.A. "Two Cities of Bavaria." W. A. Clarke.
North Middlesex P.S. "Warm Tones on Alpha Plates." H. V. Abbott.
Richmond Camera Club. "Bromide Enlarging." A Member
Rochdale Phot. Soc. "On the Broadlands with a Camera." E. Horsfall.
The Camera Club (London). "Florence and some Cities of the Etruscan League." Walter Sanderson.
Wimbledon and District C.C. "Wild Life in a British Forest." F. Martin Duncan.

Friday, December 15.

Royal Photographic Society. Discussion: Panchromatics.
Wakefield Phot. Soc. "Principles of Pictorial Photography." Fred Thorne.

Saturday, December 16.

Partick Camera Club. Whist Drive.

ROYAL PHOTOGRAPHIC SOCIETY.

At the meeting held on December 1 last a paper by Mr. L. E. Banfield, on "Summer Photography in India," was read by his brother, Mr. A. C. Banfield. The author, who has lived in India for many years, dwelt upon the many difficulties of practising photography in a country where often the shade temperature is well over 100. He had a well-fitted dark-room, measuring 12 by 8 ft. and 10 ft. high, but its one drawback was its temperature, which very frequently was 104 F. The town supply of tap water was available only for two hours, morning and evening, and in midsummer would have a temperature of 110 F. when first turned on, falling, perhaps, after a little while to about 80. Therefore, water had to be previously cooled by storing it in a few of the 10-gallon earthenware porous jars, known as "mutkas." The drawback to this method of cooling water was that mosquitos in countless thousands clung to the sides of the jars, and would begin their operations as soon as the photographer shut the dark-room door. Application to the body of an essential oil, such as citron, spike or lavender, would give respite for a time, but even this measure was not the only one which had to be taken before work could be begun. It was necessary to make sure that the room was free from snakes. Scorpions were such frequent visitors that Mr. Banfield kept a piece of plank specially at hand for flattening them.

For getting the developing and other solutions to a working temperature a large bath full of water was cooled with ice, and all the tanks of solution, including the fixing tank, kept in this cooled water. After developing and fixing, films were treated in 10 per cent. formaline solution for 20 minutes, after which, for washing, they might be risked in the tap water, if it happened to be running.

Drying the films presented equally serious difficulties, owing to the eating of the gelatine by little fish ants, which ploughed a way across the wet film, like skiers on snow.

Mr. Banfield strongly urged that the difficulties of photo-

graphers in the Indian summer should be more thoroughly considered than they had been. The requirement was some hardening agent which could be applied to the films before development. Hardening after development was almost useless, because the temperature of the dark-room might be anything up to 120 deg. F., and the moment the cage of film was lifted from the developer the hot air of the room began to exert its fatal effects, so that if there was the delay of a second or two in transferring the film into the next solution, the emulsion might run into a mass of jelly. Mr. Banfield had tried every hardening agent, without finding one which gave him satisfaction. Despite these difficulties, there was an enormous attraction in using a camera among the innumerable scenes of Indian town and landscape, but civilisation was changing the customs and costumes of Indian natives, and, therefore, the need for pictorial records, particularly of figure studies, deserved to be strongly emphasised before the opportunity for making them had passed.

The paper aroused an active discussion, in which Messrs. W. B. Ferguson, N. E. Luboshey, and T. H. B. Scott took part. A hearty vote of thanks was accorded to the author and reader of the paper.

Meeting held Tuesday, December 5, under the control of the Pictorial Group, the president, Mr. W. L. F. Wastell, in the chair.

Mr. C. Lewis Hind delivered a lecture, entitled, "The Lesson of Photography," before a large and distinguished audience. Mr. Lewis Hind said he spoke, not as a photographer, because he had never taken a photograph, but as a lover of art in all its forms. The painter's point of view often made him angry, and the advice of some painter friends to "rub it in" to the photographers at this meeting did not find favour in the lecturer's mind. The so-called feud, which was at one time assumed to exist between photographers and painters, was now quite a myth, said the lecturer, as the true artist, whatever his medium may be, was the man who reproduced the essential and repelled the unessential. The often debated point, "Is photography an art?" depends entirely upon the man. Photographers may be artists every bit as much as the painter, while all painters were not artists. It had also been argued that the so-called faking or improving of negatives should not be encouraged, but this, said the lecturer, was nonsense. It did not matter what means the worker used so long as the result justified those means, and any tricks may be adopted providing the effect was obtained. Turner once used the soot from a chimney-back to produce an effect in one of his works, said Mr. Hind, and so, to-day, painters use mixtures of pigments and mediums to produce the desired result. The lesson of photography was explained by the lecturer in the fact that as photographers go on, the more and more will they annex representation, while the more painters go on the less will they annex representation.

The field of representation will, in future, be held by the camera, which can portray the true representation of a subject far better than the painter. Referring to the prints upon the exhibition walls in the room (architectural studies by Mr. Fredk. H. Evans), the lecturer said no painter would give results such as these. The painter would give his own view, while the photographer renders the view as it really is, and as other people may see it. Genius, said the lecturer, was above the rules of which he spoke, and could not be considered in an argument of this kind. Speaking of the reproduction of carving by photography or by the painter, Mr. Lewis Hind said the sculptor would prefer the work of the camera, for here he would have true representation, and not the addition of other personalities. The old masters of painting would be impressed by present-day photography, every bit as much as present-day photography was influenced by the old masters, and was now copying their vision. The lecturer then referred at some length to the work of Alfred Stieglitz, who, he said, was a camera artist of the highest degree. The whole future of true reproduction was in the hands of photography, said Mr. Hind; colour-photography and the cinema, showing how science was advancing, while the wonderful photographs of sports, shown from time to time in the papers, were types of representation which the painter had never achieved.

In the discussion which followed, Mr. Child Bayley said he was pleased to hear the lecturer mention Mr. Alfred Stieglitz, a worker whose art would some day be truly appreciated. Upon the proposition of Mr. J. Dudley Johnston, a hearty vote of thanks was accorded the lecturer for his able discourse.

At the conclusion of the lecture two exhibitions of photographs were declared open. Mr. F. C. Tilney, in referring to the work of Dr. White, in the ground floor exhibition room, said this was a collection of prints made by this eminent worker when he was about 24 years of age, or between the years 1855-1857.

Mr. F. H. Evans then made a few remarks in reference to his pictures of Westminster Abbey, and the meeting ended by the showing of a number of excellent lantern slides upon the screen.

CROYDON CAMERA CLUB.

The announcement in the syllabus that Mr. J. M. Sellors would lecture on "The Negative and the Bromide Paper: Common-sense Applied to Exposure," ill-prepared his audience for the large amount of organised common-sense it had to absorb last week. The previous week members had experienced a fair dose at the hands of Mr. C. M. Thomas, but this was soothing syrup compared to the administrations of the redoubtable honorary secretary, who must have been busy preparing his lecture for months past.

In addition to making lantern-slides, much apparatus, and tests of scales of gradation of over 100 varieties of bromide papers, four dozen beautifully made slide-rules, with two moveable scales, were designed, constructed, and distributed. They involved 48 bromide enlargements; the cutting up of 400 pieces of cardboard dead true; dry mounting on face-plates; and assembling and fitting. Stupendous!

By its aid in conjunction with such every-day appliances as a calibrated wedge of H. and D. densities, and a Sanger-Shepherd density meter, the labour of making trial exposures on a slip of bromide paper, with its attendant anxieties and uncertainty as to the best exposure, either for contact prints, or enlargements and reductions is entirely eliminated. Owing to a virulent excess of material, the slide-rule was never reached, and by request its consideration was postponed to a vacant date at Christmas, when it should add materially to the festivity of the season. Having regard to this, much matter considered by him can be more conveniently dealt with then.

He started by referring to a somewhat similar system of exposure demonstrated over nine years ago, and he inquired whether any had adopted it, but obtained no answer in the affirmative, his audience now looking distinctly uneasy. "It is evident all intelligent members have since left the club," he bitterly commented, following with a suggestion that his proposed lecture should be abandoned in favour of ping-pong. The implements of the game not being on the premises, he was asked to get on.

Proceeding, he said that in his opinion scientists were well-meaning, and if they presented things in revolting fashion, in this respect they were no worse than medical men. It was a great mistake for the practical man to ignore scientists, for after all, they were fellow-creatures and displayed remarkable intelligence at times. Messrs. Hurter and Driffield were amateurs like themselves (no uncomplimentary inference intended) who set out to evolve order out of chaos, and were remarkably fitted for the job.

Next came a really luminous exposition of shadow, prism, and grease-spot photometers, all simple instruments, yet capable of accurate work. This was followed by an equally clear description of the calibrated wedge. Hopelessly behind time at this stage, a number of diagrams received far too brief attention. He finally wound up with a grievance against some manufacturers of bromide-paper, who inserted it in envelopes, apparently with a special machine guaranteed to prevent withdrawal without damage. The system adopted by the Kodak Company was, however, excellent.

In the discussion, Mr. H. P. C. Harpur said he was possessed of a fair vocabulary, but no words could express what he thought about the system advocated. Turning to the infinite, he portentiously added that the lecture, instead of awakening in him a wish to know more, had induced a strong desire to know considerably less. On the other hand, much appreciation for a lecture of unusual interest, one which must have involved an enormous amount of work, was expressed by many. Mr. J. W. Purkis said it was the finest scientific lecture on popular lines he had ever heard, and was an object lesson in showing that really useful research work could be done with simple apparatus. The lecturer had also interpretated in a very plain way the "shorthand" so largely used by scientists, and little understood by the general run of photographers.

ANGLO-HIBERNIAN TRADING CO., LTD.—Since the particulars given on page 730 in our issue of December 1 last were filed, the registered office of the company has been transferred, so we are informed, to 6, Great Arthur Street, Goswell Road, London, E.C.1.

Commercial & Legal Intelligence.

FAILURE OF A PHOTO ENLARGEMENT CO.—At the offices of the Board of Trade, Carey Street, W.C., last week, the statutory meetings of creditors and contributories were held in the matter of Spencer Enterprises, Ltd., 179, Archway Road, Highgate, N.

Mr. G. D. Pepys, Official Receiver, presided, and reported that the winding-up order was made on April 11, 1922, on a creditor's petition. No statement of affairs had yet been filed, but the late managing director, Mr. Henry Spencer, was engaged in preparing it. The company was incorporated as a private company on January 4, 1921, with a nominal capital of £3,000, subsequently increased to £5,000, to acquire and carry on business, in which Mr. Spencer had been engaged, called The Spencer Picture Framing and Portrait Enlarging Co. Mr. Spencer had signed the minute book and documents as chairman and managing director, and his wife had acted as director and secretary. On October 17, 1921, a Mr. Wm. J. McDavid was appointed secretary and director in place of Mrs. Spencer, but he resigned a month later.

The business had only been commenced a few months before the incorporation of the company, and consisted of selling painted enlargements of photographs, to be paid for on a weekly basis. The work was not done by the company, the oil paintings being prepared by certain firms of enlargers, and they were delivered to customers through the medium of various branches which were opened to obtain orders and collect payments.

The working capital seemed to have been procured from various persons who answered advertisements inserted by Mr. Spencer asking for branch managers, who were to receive £4 or £5 per week, plus a percentage of profits. Each manager was to deposit a certain amount of money, usually £200 or £250, with Mr. Spencer. This was the procedure before the incorporation of the company, and each manager received a service agreement under which his deposit or investment was returnable with interest at the end of one year, and each branch manager was given a lien on the assets of his particular branch. Up to the end of December, 1920, the records showed that about eleven managers had joined Mr. Spencer, and that about four branches had been opened. Under the sale agreement to the company, the purchase consideration was £2,000 in shares, and Mr. Spencer was relieved of all liabilities in respect of the business and indemnified against any claims which might arise thereunder.

After the incorporation of the company, Mr. Spencer, as managing director, continued to procure further managers, who paid to him sums varying from £200 to £250 each as an investment in the business of the company, and each of those managers entered into a service agreement similar to the others, but there was one important difference, namely that although each manager was given a lien on the assets of his branch by the agreement, the lien or charge was not registered as a charge on the business assets. Further branches were opened in various parts of the country, until at one time there were about 30 branches in existence, and it rather looked as if Mr. Spencer devoted his attention more to procuring a larger number of managers and their investments, than to putting the earlier branches on a paying basis. The company was short of funds throughout, and its growing expenses were only met by the fresh investments coming in from new men.

In October, 1921, 80 debentures of £25 each, secured as a floating charge on the assets of the company, were issued to Mr. McDavid, who paid to the company £200. Some three days later Mr. McDavid appeared to have become dissatisfied, and obtained the return of £1,000. The Official Receiver was of opinion that there was certain evidence that the business could have been worked economically as a one man business, but having regard to the reckless way this company had carried on, there was no prospect of success. From lists prepared by Mr. Spencer the preferential claims amounted to £1,943, debenture holder's claim £950 plus interest, unsecured creditors £12,047, making a total of £14,940, but that did not include liability to customers for enlargements for which they had already paid. The total deficiency was roughly estimated at £20,000.

The liquidation remains in the hands of the Official Receiver.

NORMANTON PHOTOGRAPHIC SOCIETY.—A new society has been formed under the above name, with Mr. W. Warburton as president. Meetings are held weekly in the Baptist Schoolroom, and persons interested are asked to communicate with the secretary, Mr. F. R. Townsend, Myrtle House, Altofts, Normanton, Yorks.

News and Notes.

THE KODAK MAGAZINE.—A monthly magazine, dealing with the attractions of Kodak amateur photography, is being issued by the Kodak Company and will be obtainable from all Kodak branches and dealers, price 2d. per issue. The first number, namely, that for January next, will be on sale on or before December 20 next. Succeeding issues will be published on the 15th of each month.

A MEETING of the Scientific and Technical Group of the Royal Photographic Society will be held on Tuesday, December 12, at 35, Russell Square, London, W.C.1, commencing at 7 p.m. Two papers will be read as follows:—"Description of the 'N.S.' Cinematograph Camera," with special reference to an electric drive, by A. S. Newman, and "The Factors Which Determine Gamma Infinity," by Messrs. G. I. Higson and F. C. Toy.

KODAK PROFESSIONAL REQUISITES.—An 8-page circular, just issued by the Kodak Company, and obtainable from them at Kodak House, Kingsway, London, W.C.2, describes and illustrates a number of recent introductions, among which are "portrait gift certificates," mask charts for trimming prints, and head screens. The booklet also gives the substantially reduced prices at which the Eastman Portrait diffusion discs are now supplied.

PHOTOGRAPHS ENHANCE A BLUE BOOK.—One does not look for interesting photographs in a Government "Blue Book," but they are used with good effect in one published by the Royal Commission on Historical Monuments. It is called "An Inventory of the Historical Monuments in Essex," Vol. II., and is issued by H.M. Stationery Office at £2. This handsome, well-bound volume is printed on fine paper, and contains over 300 pages, profusely illustrated with excellent and specially-taken photographs.

CAMERA HOUSE JOURNAL.—The Christmas gift number of Messrs. Butcher's little publication gives particulars of articles most suitable for presents at this time of the year. Prominence is given to the Primus engineering sets, while lanterns and toy cinematographs also find a place. Sample strips of the patent passepartout binding are included in the booklet, so that dealers may test this material for themselves. The Journal is obtainable by the trade only, upon application to Messrs. W. Butcher & Sons, Ltd., Camera House, Farringdon Avenue, London, E.C.4.

PHOTOGRAPHIC PORTRAITURE IN TURKEY.—The writer of the paragraph appearing under this heading on page 731 of last week's issue writes as follows: "The omission of two words in the fifth line makes this item of news read very peculiarly; the line should read 'the making of pictures of living things,' etc. The actual words of the Koranic command are 'Every painter is in danger of hell fire, and Allah will appoint a person at the day of resurrection to punish him for every picture he shall have drawn, and he shall be punished in hell. So if ye must make pictures, make them of trees and things without souls.' Happily for some of us photographers are not painters, though the true Moslem considers a photographer to be one."

ROYAL INSTITUTION LECTURES.—The Juvenile Lectures at the Royal Institution this Christmas will be delivered by Professor H. H. Turner, whose subject is "Six Steps up the Ladder to the Stars." The first lecture will be given on Thursday, December 28, on "The Distance of the Stars," followed by "The Discovery of the Planet Neptune," "Photographing the Stars," "The Spectroscope and its Revelations," "Two Great Streams of Stars," and "The Size of a Star." Among the lecture arrangements before Easter are:—On Tuesday afternoons, commencing January 16, there will be two lectures by Professor F. G. Donnan, on "Semi-Permeable Membranes and Colloid Chemistry," two by Mr. R. D. Oldham on "Earthquakes," and two by Professor C. G. Seligman on "Rainmakers and Divine Kings of the Nile Valley." On Thursday afternoons, Professor B. Melvill Jones will give two lectures on "Recent Experiments in Aerial Surveying." The first Friday evening discourse will be delivered by Sir James Dewar on January 19 on "Soap Films as Detectors of Stream Lines, Vortex Motion and Sound."

A NEW FRENCH JOURNAL.—Those who are readers of Continental photographic literature are no doubt familiar with the admirable supplement to "La Revue Française de Photographie," compiled by M. L. P. Clerc, and entitled "Science Technique et Industrie Photographiques." We learn from the current issue of our contemporary that next year this supplement is to be made a separate monthly publication, bearing the same title, under the editorship of

M. Clerc. Each issue will consist of from 32 to 40 pages of text, and will include a bibliographical review of the scientific, photographic, and cinematographic press of all countries, in addition to original articles and communications. We are quite sure that "Science Technique et Indnstries" will merit the support of all those who are interested in the advances which are being made in any country in photographic processes, materials or apparatus. The annual subscription for the new magazine will be 12 francs for places in France; 17 francs for places in the Postal Union. Applications for the new publication should be addressed to M. Paul Montel, 35, Boulevard Saint-Jacques, Paris XIVe.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

EASILY-MADE ANNOUNCEMENT SLIDES.

To the Editors.

Gentlemen,—The December issue of the R.P.S. "Journal" has arrived containing Mr. Wastell's Presidential address on "The Evolution of the Lantern Slide."

Mention is made in the address of some transparent drawings by Della Porta over 300 years ago, drawings in which we find the prototype of the lantern slide, and the mention of these old-time lantern pictnres reminds me of a wheeze I thought ont and worked successfully during the recent general election. The process, which I mnst admit is not purely photographic, may be of service to some of yoor readers who have a lantern.

Having made photographic lantern slides of election subjects, portraits, events, etc., I was asked what I could do in the way of making announcement slides quickly and effectively. Time did not allow me to get the commercially prepared black slides for writing upon, or to make slides with matt varnish, not having the latter at hand.

What I did was to write the required announcements on ordinary writing paper using waterproof black ink; these were then dried on the hot-water pipes in the room. When dry, and still on the water pipes, the writing paper "slides" were rubbed well with the bottom end of a wax candle; the heat caused the candle to melt and saturate the paper, making it beautifully translucent, and in a condition to show well upon the screen.

The waxed paper slides were then placed between two pieces of plain glass for use in the lantern carrier. The glasses were not necessary (but advisable) when stiff paper was used, but if kept for a long time in the lantern the heat caused the unglazed slides to buckle a little and get out of focus. Glazing kept the announcements flat and in focos. Slides made in this way cost little or nothing, and they are most effective, taking but a minnte or so to make.—Yours faithfully,

A. Reeves.

LANTERN SLIDES FROM HALF-TONE ILLUSTRATIONS

To the Editors.

Gentlemen,—Some time ago there appeared in your pages hints concerning the copying of half-tone illnstrations and various methods of eliminating or minimising the "dots" were given. Hitherto when I have made lantern slide copies of half tone originals I have over exposed the copy negatives, over-developed them, and afterwards reduced in the hypo-ferricyanido reducer a plan advocated by one of your correspondents for doing away with the screen effect when the pictnre is enlarged npon the lantern screen.

A few days ago I was called upon to make some more slides for lecture purposes from half-tone originals, and I have discovered what I believe to be a better system of working, it is certainly an easier plan, and the results—if the half-tone screen is not too coarse—are very satisfactory.

The method is to make the copy negatives on the Barnet matt plates, the matt emulsion of these plates helping to eliminate the dot effect. If the slides are then made by contact from the matt-surface negatives the dots almost disappear. The matt grain of the negative film seems to prevent the film of the lantern plate coming in very close contact with the developed image, and if a soft diffused light, and not a point of light, is used for printing, very satisfactory and soft results can be secured. Imperial matt lantern plates were used for some with success.

It may be argued that if this plan of working destroys the dots it will also destroy the clearness of the outlines of the picture, and, also, that the grain of the matt emulsion is likely to interfere with the brilliancy of the high-lights as seen in the finished slide. In theory these arguments are against the process, but in practice they need not be considered, for the results are most pleasing.

I have made some very good copy negatives on the Imperial matt transparency or lantern plate. The grain of the latter is much finer and not so perceptible as that found on the Barnet plate; it is more opalescent or "milky," and capital for transparency work, it taking the pencil very well. Too brilliant spots of high-lights on these lantern plates may be pencilled down without the lead appearing grainy. Yours faithfully,

W. L. Mevnell-Thompson.

LUBRICATING ROLLER-BLIND SHUTTERS.

To the Editors.

Gentlemen,—Roller-blind shutters often stick at low speeds and with low spring tension, and it is necessary to apply some kind of lubricant. I find that powdered French chalk is an excellent substance to remedy this trouble, and if a little is applied to the bearing ends of the rollers and the shutter worked several times a great improvement will be observed. Any loose powder should be blown away, and the shutter will now be quite satisfactory.

Yours faithfully,

G. Garner.

Bridge Street, Cookbrook, Slough.
November 28.

BROMOIL AND BROMOIL TRANSFER.

To the Editors.

Gentlemen,—The article by Mr. C. J. Symes interested me, and no doubt hundreds of others, very much. I am an enthusiastic Bromoil worker and transferer. There are, however, one or two points in Mr. Symes' article that I must take exception to.

In my opinion, the strength of the fixing baths is immaterial, as also is time of fixing providing the print is thoroughly fixed. As regards temperature of solutions, this is not so important as most workers would have us believe; it is not essential that all solutions and the washing water should be at the same temperature. Quite a good Bromoil can be obtained from a bromide print that has been over-exposed and under-developed; in order to soften high lights I frequently over-expose to get a softer effect. Regarding the transfer process, I have used all the brands of papers mentioned by Mr. Symes, and the one I find most useful both for bromoil and transfer is Vitegas (20 B and 21B). Mr. Symes is quite in error in saying that Vitegas is not suitable for transfer. If either Mr. Symes or yourselves would care to see some transfers from Vitegas I shall be very glad to send some for your inspection, also transfer from an over-exposed under-developed Vitegas print. When inking up from transfer, I generally get as hard a print as possible, frequently intensifying the negative with uranium, as I find that the shadows transfer 50 per cent. of ink, and the high-lights some 90 per cent. or 95 per cent., which with a suitable Bromoil will give a flat transfer.

For transfers I invariably ink up with a roller. Now comes the only point I have against Vitegas: it will not stand very much work with a roller, as the base splits and comes up in blisters, which, if large, show in the transfer as a dark line; if small, they will not trouble you.

Still I prefer Vitegas, and my method of working is to get a hard print and use ink thinned down so that the suction caused by the roller is not sufficient to split the base. If Messrs. Kosmos, Ltd., would make a Bromoil paper on a base that did not split under the action of a gelatine roller, they would have an ideal Bromoil paper. A whole plate print that has been bleached and dried a month or more can be inked up after not more than ten minutes soaking in cold water. I prefer an amidol developer, very much diluted.

When requiring an unusually hard Bromoil for transfer I frequently fix in an acid hardening fixing bath, soak in very hot water for ten minutes, and finish soaking in cold water. I prefer

to dry prints both after fixing and after bleaching, etc. I find a one-solution copper sulphate bleacher quite the best.

When a very large print is to be inked, and trouble from drying is anticipated, the bleached print can be kept in working order by finishing up the final soaking by ten minutes in a 40 per cent. or 50 per cent. glycerine solution, which keeps the print damp for days. More care is required in blotting off after a glycerine bath.

I have frequently mounted a Bromoil on Vitegas less than four hours after inking up. I am not connected in any way with, nor have any interest in, the makers of Vitegas.—Yours faithfully,

H. KENWAY.

Hagley, Gt. Ormes Road. Llandudno, December 2.

THE P.P.A. CONGRESS.

To the Editors.

Gentlemen,—By report in "B.J." I see it is proposed to hold an "abbreviated" congress in March. If there are to be no demonstrations, lectures, or exhibition, it will attract very few, and then it will be said that the Spring Congress was a failure, as compared with the Autumn.

If a full programme cannot be arranged, it will be better to postpone it. The date should never have been altered, as the Spring Congress was always a success.—Yours faithfully,

"COUNTRY PRO."

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

DISHES.—The firm for large size, deep, enamelled steel dishes is Messrs. O. Sichel & Samuelson, 52, Bunhill Row, London, E.C.1.

W. B. C.—The firms for readings for lantern slides are Messrs. Newton and Co., 37, King Street, Covent Garden, London, W.C.2, and Messrs. York and Sons, 3, Emperor's Gate, South Kensington. London, S.W.7.

E. B.—Your arrangement as sketched should work very well, but it would, we think, be better to keep the three lamps more to one side of the sitter, as in your plan the lighting would be very flat. We prefer clear lamps with the thinnest possible nainsook for diffusion. Japanese silk, if thick enough, would answer well, but it has a tendency to turn yellow when washed.

F. B.—Two books which should suit you are:—"The Handbook of Cinematography, by Colin Bennett, published by Messrs. E. T. Heron and Co., 9, Tottenham Street, London, W.1., price 5s. 6d. post free, and "Practical Color Photography," by E. J. Wall, obtainable from our publishers, Messrs. Henry Greenwood and Co., Ltd., 24, Wellington Street, London, W.C.2, price 13s. 3d. post free.

P. S. S.—Ether, benzene (not benzole), or petrol would remove the linseed oil stains. The best method would be to place a piece of clean blotting paper over the stained spot and to pour a small quantity of the solvent upon this. Gentle pressure combined with warmth of the fingers will help the removal. Care should be taken that no open flame is near when the work is being done.

E. M. S.—"Commercial Photography" deals to the extent of 4 or 5 pages with engineering subjects, though it does not touch specifically upon the making of phantom views. These are usually done by coating the glass side of the negative with a matt varnish (which may be slightly tinted) and scraping away the parts which represent the foreground part of the subject. The background is thus caused to print faint.

S. W.—The copyright in the photographs is the property of the photographer who originally gave the complimentary sitting. You will be infringing that copyright by copying the prints to your customer's order. The fact that she has subsequently purchased and paid for portraits from the original negatives does not affect the matter. The owner of the copyright is naturally quite entitled to sell prints from the negatives to anyone he likes.

A. Y.—Unless you specifically undertook to make the negatives for delivery to your customer, or unless you have worded your invoices so that it might be reasonably supposed that you meant the negatives to be the customer's property, the customer has no right whatever to the negatives. This question has been decided on several occasions in the Law Courts, and is dealt with at length in the little manual which we publish, "Photographic Copyright." If you are going to charge for the negatives, a price which has been recommended by the P.P.A. is that of from 10s. 6d. to 15s. each.

S. F.—No trouble should be experienced in developing the plates which have been exposed 10 years if a pyro soda developer is used diluted with an equal volume of water and to which 10 per cent. potassium bromide solution is added in the proportion of 1 minim to each ounce of mixed developer. You will probably get dark edges in your negatives owing to the age of the plates, but if the exposures were correct, or nearly so, and the plates have been carefully stored, you should get quite good negatives. If the diluted developer is found to be working too slowly, remove the plates and place them in a correct strength developer.

J. R.—We are afraid that the regular apprenticeship system has gone by the board of late years, and the conditions under which the present day master photographers were apprenticed no longer apply. We do not think there is any usual custom as regards term of years or remuneration of the apprentices. Some people get £50 premium and pay the apprentice next to nothing, while others get little or no premium and pay the apprentice 10s. a week and upwards. We rather have the idea that the P.P.A., of which no doubt you are a member, has a model form of terms of apprenticeship which they supply for the information of their members.

E. M.—We should say it would be quite impossible to get good negatives of children in school at the present time of year using only daylight. Even with a lens at *f*/4.5 aperture and rapid plates and in an extremely well-lighted class room exposures of 10 to 20 seconds would be necessary, which would be far too long to arrest movement. We fail to see why you should not use flashlight. If after focussing you draw the blinds and stop down your lens to about *f*/11 you will be able to get results without any sign of movement. Also the present-day flash powders, such as Johnson's "Professional" powder, give little or no smoke, and children generally like the flash. We have in the past done a large amount of work of this kind, and have found the flashlight method very efficient. If you decide to work by flashlight we should recommend you to obtain a good class R.R. lens of fairly wide angle and work in half-plate size.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. PRICE FOURPENCE.

TERMS OF SUBSCRIPTION POST FREE.

UNITED KINGDOM OR CANADA.—*One Year*, £1 1s. 8d.; *Six Months*, 10s. 10d.; *Three Months*, 5s. 5d.

ANY OTHER PART OF THE WORLD.	*One Year*	£1 3s. 10d.
	Six Months ...	12s. 0d.
	Three Months	6s. 0d.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibits the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers. 24, Wellington Street, London, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3267. Vol. LXIX. FRIDAY, DECEMBER 15, 1922. Price Fourpence.

Contents.

SUMMARY.

While flashlight for commercial portraiture is scarcely considered in this country, it obtains widespread use in the United States, largely as the outcome of the supply of complete apparatus which encloses the smoke of the flash and is of ample power. We refer to the design of such studio flash cabinets in a leading article on page 750.

The current talk by Mr. J. Effel on studio portraiture deals further with the posing of hands and feet in full-length figures and gives some good advice on the things to be looked for in avoiding the stiffness of many full-length masculine portraits. (P. 751.)

Messrs. Elliott & Fry have signalised the opening of their new premises in Baker Street by holding an exhibition of portraits of eminent Victorians chosen from the work done by them during the past sixty years. (P. 758.)

A rear attachment for conversion of an ordinary field camera into one allowing of the outdoor making of while you wait ferrotype portraits is described and illustrated in a contributed article by Mr. C. J. Sims. (P. 754.)

Variety in portraiture may often be obtained by taking advantage of places, e.g., the reception room, other than the studio. (P. 750.)

In an article in "American Photography" Mr. H. G. Cleveland gives a new formula for the phenosafranine desensitiser, which facilitates the illumination of residual stain of the dye, and also confers better keeping qualities upon the desensitising bath. (P. 753.)

Mr. A. C. Banfield has described the advantageous revolution of his own dark room by the adoption of desensitising as regular practice in dealing with the development of large numbers of plates. (P. 755.)

Mr. F. C. Tilney has discovered an "Old Master" in photography John Forbes White, and has brought together at the R.P.S. an exhibition of his work, which he reviews on page 757.

The wonderfully realistic architectural photography of Mr. Frederick H. Evans is also being shown at Russell Square, together with the colour pastel prints of Dr. D'Arcy Power, which were shown some time ago at the Croydon Camera Club. (P. 757.)

Improvising dark rooms and the photography of appliances fitted within the fuselage of aeroplanes are among the subjects of "Assistants' Notes." (P. 756.)

Slowness in inking and heavy "hopping" with a hard brush are two causes which lead to failure in obtaining good impressions in the Bromoil transfer process. (P. 750.)

A great deal can be done to keep the dark room floor dry and free from chemical dust by the design of working benches, even in circumstances where the use of sinks of ample size is not practicable. (P. 749.)

We refer once again to the reduction of retouching which follows from the use of panchromatic plates for freckled or fair sitters. (P. 749.)

One or two hints on the use of backgrounds are given in a paragraph on page 750.

EX CATHEDRA.

Panchromatic Portraiture. Now that tank development has become a commonplace of the studio, and the last difficulty in the way of using panchromatic plates has thus been removed, it may be worth while to point out the great advantage of using panchromatic plates in conjunction with half-watt lamps upon sitters who, from freckles or other unequal colouring of the skin, provide too much work for the retoucher. It is only by a careful test between an ordinary or even an orthochromatic plate and a panchromatic that the extent of the improvement can be realised. It has been found that under similar conditions the lighting appears softer in a panchromatic negative than in an ordinary one. With very deep yellow hair, especially if conjoined with blue drapery, a pale yellow filter may be used with advantage, but care must be taken not to overdo the correction, or the result will appear somewhat insipid. If too dark a filter be used, deep golden hair will appear as if flaxen, which is wrong. The multiplying factor of the filter, it should be noted, is much smaller with panchromatic than with orthochromatic plates.

* *

The Dark-room Floor. Visiting several dark rooms lately we have been struck by the apologies offered to us by their owners as to the wet state of the floor. The trouble usually occurs from the fact that benches are used for the various developing and washing operations, and any liquid which is spilled naturally runs to the floor. Apart from the general discomfort is the danger of these solutions drying and allowing the crystals of chemicals which they once contained to be blown about and ultimately deposit themselves upon everything in the room. If it is impossible to have a large enough sink to take all dishes and washing apparatus, it will be found of great use if the benches are covered with thin sheet lead. To do this effectively a rail of wood, one inch square, should be placed round the edge of the bench top to convert this into a kind of large dish, and the sheet lead hammered over this. The bench should be given a slight tilt to one end, so that all solutions spilt from the dishes will run towards one end. At this end a slot should be cut in the wooden rim and the lead bent down to form a spout. If the bench is over a drain the liquid may be made to run into this, but if the drain is some distance away, a funnel, to which is attached a sufficiently long piece of rubber tubing, may be utilised to carry the spillings to the proper place. The floor should be covered with lattice boards, made by nailing strips of rough battening about 2½ inches wide, to each other, crossing at right angles. It is also necessary to keep all utensils off the floor, and cupboards under benches should be avoided. It is then possible to keep the floor perfectly clean.

Unpremeditated Lightings. The portrait photographer who aims at variety of effect will do well to keep his eyes open for accidental poses and lightings. Very often an observant eye will discover quite a pleasing effect in the most unexpected quarters, and it is advisable if the picture cannot be secured at once, to make a careful note for future use. Elaborate efforts to secure a certain effect in the orthodox position in the studio often result in a more or less qualified failure, while the impromptu arrangement is successful because of its very naturalness. There are great possibilities in many well-lighted reception rooms, and although it is not often practicable to bring the studio camera to the sitter, a satisfactory negative could generally be obtained with a reflex. With nervous sitters and some classes of children such an informal way of working would go far to secure a natural and unstrained expression. In the studio itself the possibilities of every foot of floor space should be ascertained, so that the sitter could be photographed in the first seat she was allowed to occupy without any apparent formality.

* * *

The Background. In the modern studio the background is not so much in evidence as it was in by-gone days, but it is of no less consequence, and in its simplified form requires a considerable amount of skill to use it to the fullest advantage. As a minimum, a frame, say, eight feet by six, covered on one side with a light grey material, and on the other with a very dark, nearly black, one, may be made to answer for nearly all purposes. If sketch pictures must be made, the light side should be white, and the wall of the studio used as an intermediate tint. A very useful addition to the background frame is a couple of brackets upon which a rod to carry a plain curtain can be fixed. This should not be "draped" in the old-fashioned way, but allowed to hang in straight folds. It is not realised by all to what an extent the depth of tone of a background can be altered by turning the surface to or from the light. This also will be particularly noticed in studios where some form of spot light is used. The light from this type of lamp may be flooded over the background or softened down by the use of colour filters in front of the lamp, thereby permitting many changes in the depth of tone of the background. With quite a dark grey material it is possible in this way to make the ground appear lighter or darker than the shadow side of the sitter's face.

* * *

Bromoil Transfer. When making a Bromoil print for transferring, care should be taken that the surface is not allowed to become too dry, owing to prolonged inking. It should be borne in mind that the ink is gradually drying on the print, and if much time is allowed to elapse before transferring, trouble will be experienced. It should also be borne in mind that too heavy "hopping" with a hard brush is liable to render the gelatine somewhat soft, and it is often from this cause that during transferring the gelatine leaves the original bromide print and adheres in pieces to the transfer. Bromoil prints, which are for transferring, should be inked by the most gentle means, the soft pole-cat hair brush being used with a dabbing action in preference to the hard hog-hair brush, which should only be used to brighten up high-lights, and then as little as possible. All methods of control should be left, in this case, until after transfer, when ink may be added or removed as the worker desires. It often happens that extra depth is required in the shadow portion of a transfer, the high-light and half-tone being satisfactory. This is obtained by re-inking the shadows of the Bromoil only and transferring again. Care should therefore be taken that the print and transfer paper are attached in some manner, so that the transfer may be put back into perfect register. We have found that four pinholes made along the top of the transfer and print when first put into contact serve as an excellent guide when re-transferring.

FLASHLIGHT IN TWO HEMISPHERES.

After a careful study of American photographic literature dealing with flashlight photography, both of single figures and of groups, one cannot fail to be struck by the very different ways in which this class of work is regarded upon the two sides of the Atlantic.

In this country the flashlamp is regarded by most professionals as a necessary evil which is to be employed under protest when there is no other way of securing a negative. The majority of photographers do not seek flashlight work, and as a rule do not show specimens of it. Consequently, few professional workers have given serious attention to the matter, and, there being no demand for efficient flashlight apparatus, little in this way is offered by our manufacturers or dealers.

In America we find a totally different feeling, as a perusal of the photographic magazines will show. Here, in a single number, we may find as many as four different arrangements for making the flash, and these are not the tiny hand lamps which are so generally sold to amateurs, but substantial, yet not ponderous, bags or lanterns, in which the powder can be ignited without allowing the resulting smoke to escape. Herein is the great secret of the American worker's success in this class of work. He is not regarded as a nuisance wherever he goes, and consequently is welcomed where his English confrere is barely tolerated.

It should not be difficult to remove this disparity in practice, either by importing the necessary apparatus or by constructing something which will answer the purpose. There are two distinct types of ignition chamber in general use. One is an entirely flexible bag supported upon a collapsible frame; the other, a folding cabinet which may be compared to a large portfolio, of which one side is opaque and the other is a light frame covered with calico or similar material; side flaps serve to separate the two sides, so as to form a wedge-shaped box and to confine the fumes. A stand is needed to support the whole at a convenient height, and this should be adjustable for standing or sitting figures. The actual lamp may be any of the many patterns on the market, but if electric ignition be possible it is the most convenient in use; it may either take the form of a wire fuse which requires a fairly high voltage to "blow" it, or the special fuses made by Boots, and which are ignitable by an ordinary torch battery. The latter are perfectly efficient when fresh, but are not to be relied upon after a month or two. The wheel and flint, as used in many gas lighters, also work well, and apparatus of this type is very suitable for use in a bag. Ignition by means of a cap, as in the Charles lamp, is also good, if the proper caps are used; toy caps cannot be trusted to give a good spark.

An efficient flash bag of the first type can be constructed by taking an ordinary umbrella frame, which should be strongly made and in good condition, as a basis. The handle of this should be socketed in a strong bamboo or other stick, so that the top of the frame is about eight feet from the floor. This stick may be clamped to a chair or the lower part of the support may be made of a metal

music-stand. The cover consists of fine, rather thin calico, the upper part being made in the same way as an ordinary umbrella cover, but not attached to the ribs. Round the lower edge of this is sewn a curtain or "skirt" about five feet long, with a hem and draw-string at the bottom. At about three feet from the hem a square opening, about fifteen inches by twelve, is cut, and covered with a flap about twenty by sixteen inches, with two or three buttons or other fastening. This is to allow of the manipulation of the lamp, re-charging, etc. The string actuating the ignition release may be brought through the bottom, or a small opening made in any convenient place. If desired, a black curtain may be fixed over the side of the bag which is nearest the camera. This will allow of the lamp being placed nearer the sitter without risk of fogging the plate. The bottom of the "skirt" should be kept closed, as the smoke has a tendency to descend. If care be taken to allow the smoke to settle inside the back, several flashes may be made without taking the apparatus outside. It is, of course, absolutely necessary that the calico be fire-proofed, which is best done by treating with the following solution. The fabric must be treated anew each time it is washed, as washing removes the chemicals.

The solution is made of common salt, 1 oz.; borax, 2 ozs.; and sal ammoniac, 5 ozs.; dissolved in one quart of boiling water.

The dry fabric should be immersed for at least five minutes, and then hung up to dry, without wringing. It is advisable to hang the fabric with the closed top downwards, so that the solution, as it is concentrated by drying, is retained in the part which will be nearest the flash.

It may be necessary that those whose experience has been confined to the unscreened flash, should be made to realise that with a properly-controlled light it is possible, even easy, to produce portraits which can be compared with the best daylight work. In America there are many photographers who prefer the flash to all other lights for child portraiture, the rapid flash securing expressions which are too evanescent for the shortest daylight exposure. An important point is not to over-light. Many of the best single-figure negatives have been made with from seven to ten grains of powder.

WITH A PORTRAITIST IN THE STUDIO.

[In the concluding portion of his paper dealing with the posing of hands and feet in the full-length figure, Mr. J. Effel points out the necessity of getting the sitter into a comfortable position. The correct balance of curved and straight lines is of great importance in full-length, three-quarter length and small groups, and Mr. Effel describes some methods, along these lines, for posing the single full-length figure. The lighting of such a subject is also considered in detail, while some homely advice is given in reference to handling the sitter.]

X. (*continued*)—HANDS AND FEET: THE FULL LENGTH.

As I have said so often before, George, the first thing we have to consider about a full length is the placing of the feet. It is really a very simple matter. Always bearing in mind the rule about the model standing with the weight thrown on one leg, you can scarcely go wrong. The feet are much more amenable than the hands, and an easy "stance" is not difficult to get. I have given you a few illustrations of ladies' feet in easy attitudes, which you ought to put in your scrap book, but if you want a wide range for study, and wish to have at your command all the little tricks of posing cultivated by artists and photographers who have specialised in fashionable portraiture, you cannot do better than study the high class magazines and ladies' fashion journals.

You remember that 15 by 12 group we took at the barracks last month. Well, the sergeant who brought me the orders and collected all the cash is coming in this morning, and I have told Miss Richards to show him up whenever he arrives. We'll take him one or two full lengths, and give him some nice pictures for his trouble, and at the same time we'll have a good model. There's the 'phone, George, from the reception room, see what it is, my lad. What? Sergeant Wilson in? That's lucky; get them to send him up at once.

Good morning, sergeant, I'm glad you got such a tidy little order for the groups, and that all the boys were delighted with them. I hope you have half-an-hour to spare this morning? Good, we want to experiment with your manly figure. It was awfully decent of you to take all the trouble you did in distributing those pictures, to say nothing of looking after the filthy lucre, so I think the least the firm can do is to award you some portraits of yourself. At the same time you won't mind going through a bit of drill for the benefit of my young recruit here. It will be rather a novel experience for you.

Portraits of soldiers, George, have to conform to certain standards, and it is difficult, indeed, almost impossible, to break away from the conventional. A soldier cannot dig his hands in his pockets, or adopt many of the attitudes which might be quite suitable for a mere civilian. I think you would be hard put to it to produce anything startlingly original of a Tommy, but at the same time there are faults innumerable in military portraits, so, as usual, we will pay considerable attention to what you must *not* do. At the war time we were asked so often for full lengths "with nothing at the back" that we had to do quite a lot of soldier pictures with white backgrounds, but for my own taste I never liked "sketches" of khaki-clad figures. I think the sergeant will bear me out when I say that the uniform and boots of the ordinary foot slogger were designed for utility rather than beauty, and that the cut and general effect of the habiliments did not suggest pleasing outlines to the artistic eye. So I would say, use a background that will not show up the outlines too much. That dark exterior, with the nicely-balanced light patches on the shadow side, seems to me ideal for soldiers. See that the foreground is put down with meticulous care, George. If you *do* use scenery, for goodness' sake avoid wrinkles and joins, which shatter the illusion and completely destroy your work in lighting and posing.

Now, just come down here, Sergeant, into the firing line. Stand quite easy, facing me. Will you please note, George that when I am getting a client to pose himself, it is my method to trap him into the position I think suitable, or to get him approximately right without any "handling." Nothing, to my mind, in the work of a portraitist in the studio gives such a bad impression as uncertainty. You need not necessarily start with a preconceived plan indeed, it is usually by talking to a client while moving about that the best poses are got but never build up a composition or part of one and then abandon the original idea. Occasionally I make a mistake with a position and realise it in time, but I never let the client know it. I just snap away without drawing the slide, and then proceed to the better pose. Make everything seem simple. When I asked our warrior friend to stand there and face me, there was no accident in the fact

that I was standing a good bit to the side of the studio. Most persons dislike being pushed about, or "handled," and I cannot insist too much that you avoid all unnecessary pawing. At the same time, don't spoil your chance of a good negative because you did not alter some little detail. Always show that you are masterful. If you go to stroke a timid animal, you may run the risk of being bitten if you approach it in a hesitating manner; and a sitter may also feel like biting you. Good clients who want artistic work will, however, invariably be found to be very patient and gracious. When I was a mere boy I had one day to photograph a countess and her two little children. No appointment had been made, and it was explained to the lady that only a junior assistant was available. She decided to risk it, and I was let loose. For a shy boy to be suddenly called upon to photograph a noted beauty with her children was enough to put me into a state of blue funk. I fumbled about, dropped stops, fell over my feet, and was generally uncomfortable, until, with great kindness, the countess told me in a laughing way to "just pull me about any way you like; I'm sure you'll manage beautifully." I will say nothing of the results, except that one of them was subsequently reproduced. What I am endeavouring to show is that had I been treated in a haughty manner, nothing but double exposures and other blunders would have resulted. Give the clients confidence in you, George, and you may safely "handle" them sufficiently to get good pictures.

Now, just as our model is standing there (he is quite comfortable on his feet), I wish to draw your attention to a point of great importance in all full length, three-quarter length, and small groups, the correct balance of curved and straight lines, and the underlying rule that will guide us in this particular is very simple, and I want you to always have it in your mind, particularly when dealing with standing figures. The bold sergeant stands there, his cane under one arm and the other hanging loosely by his side, his pipe held in this hand. Is the position right? Will that look well in a photograph? If it isn't right, then what is wrong, and why is it wrong? I can see you are not quite satisfied, George, but I don't want you guessing, so we will start all over again with our composition, and that will put you on sure ground.

A man stands on one foot at a time, and the weight is thrown on one leg. That leg is rigid and straight, the other is more or less bent. I am merely recapitulating briefly what we have gone over before. Now look at the sergeant. He is standing on his left leg, but his left arm is also straight, and what is wrong with the composition is that the straight lines are all on one side of the picture and the curves on the other. In standing figures, think of the figure 8 as you draw it. The top right-hand curve flows into the lower left curve, and *vice versâ*. The result is a well-balanced figure. Well, just draw the figure 8 with your subjects. Assume that one arm will invariably be bent more than the other. Take this, then, for a good working rule; place a straight leg and a curved arm together, *never two straight limbs or two bent ones on the same side of the picture*. Think constantly of this rule, George; look through scores of old full-lengths and see if the artists worked on my method, or just left the harmony to chance.

Poor old Sergeant Wilson! You've let yourself in for something this morning. You're quite enjoying it? Well, it's good of you to say so. We'll just proceed to put you through it thoroughly. Of course, you must promise not to give the game away. Well, then, change the pipe to the other hand, and put the cane under the opposite arm. There, George, there's the position reconstructed in the fundamentals. You see the body is turned considerably away from the light. The figure is good, and I want to show that. Just a trifle too much ong-bong-pong. Ah! that's better. It is common practice, George, to get stout figures to lean forward. It isn't so easy with the ordinary male subject, but a soldier who is too fat can be taken quite successfully to hide the unpleasing feature. We'll just illustrate the point. Bring both your hands in front, Sergeant, and hold your cane. No, not like that, with the hands wide apart; that might do all right with a slim sort of chap if we wanted to show his waistline, but it is camouflage we are aiming at here. Clasp your hands together. Now let me manipulate them for the benefit of my pupil. Fetch me down a walking-stick, George; this little swagger article is too short for what I am endeavouring to do. Put both hands on the stick, Sergeant, and hide one with the other. Now throw the body well forward, and press the hands down; quite a good way of steadying up an irascible and fidgetty old major, who would wither us up, George, if a head-rest was mentioned. See now, the upper arms of our model are straight by his sides, and from the elbows converging downwards to the hands, the fore-arms make a V shape across the equator of "little Mary." We'll take one like this, and then, before we do another position, George, I suggest that you take a right bad one, conserving all the width of the figure; the two will then be good examples for your scrap-book.

We have not yet considered the view of the face or the scheme of lighting. In posing, I start from the feet, and in lighting I commence in comparative darkness. I assure you, George, you cannot improve on those sound methods. Well, what think you of Sergeant Wilson's face? A fine type of the "roast beef of old England" countenance with very slight projections, so we must keep the lighting narrow. The body is turned a good bit away from the light, so we will turn the head back again a little, but not too much, as that would shorten the neck, which, as you see, is short enough. The face, at what we speak of as three-quarter, will about do—keep the second ear out, George—and the eyes slightly in advance of the turn ought to look straight at the camera. I have noticed that many splendid camera artists are very careful with the lighting of busts and half-lengths, but when they get up to full lengths the studio is invariably flooded with light. This tendency is due, I am sure, to adherence to the old "axiom" about the light coming from one unbroken source—an axiom, by the way, the breaking of which did a great deal to build up the reputation of Reutlinger as a fashion-plate photographer. Thanks largely to manufacturers who have magic lanterns to sell, we are now breaking all unbreakable rules. A khaki uniform requires a good flood of light, which for the face we have here would be too broad. Obviously, in the old-fashioned "all-one-piece" style of lighting both the face and the clothing could not have been treated as they would have been, had they been separate studies. As in a full length one works for the general effect, it is easy to see why full lengths are so frequently over lighted. Of course, there must be a little give and take between what is right for the head and what is best for the whole figure in the way of lighting, but with modern methods much better general effects can be obtained. In the present case I light the figure with a comparatively far-away front light, and then finish off, as it were, with a little bit of good direct severely side light. With all faces of low projections, work for relief; it has long been a practice with me to get a touch of light behind such sitters. I leave a fairly good bit of shadow on the face here. With a fat face, resist the temptation to use the reflector much. Well, then, there is the lighting and the position. Is there anything wrong, or may we just snap away? Yes, there is the matter of the hands again. Turn them outward, so that if the subject looked down he would be regarding the backs. You will see now that only the edge of one hand is really seen by the camera. In this or similar positions a glove—not a pair—may be used, but remember that it looks like a glove and not an old rag. Well, then, go ahead, George, and then build up another full-length as different as you choose. You have a fine chance here with a very docile model, so take full advantage of it. There was a neat little revolving platform of about 3 ft. in diameter

which I saw in the studio of a clever Italian worker. This photographer maintained that a properly-posed figure should be like a statue—that is, to look right all round. Certainly it was a clever adjunct to the student. Well, just make your victim turn about for you as you want, and select the best you can. I would say after that, take a three-quarter length and a bust without cap.

Well, Sergeant, I leave you at George's mercy. Call round this day week and we will have proofs ready for you. Cheerio!

J. Effel.

PHENOSAFRANINE DESENSITISING WITHOUT STAIN.

[In the current issue of "American Photography," that of December, 1922, pp. 756-762, Mr. H. G. Cleveland describes a modification which he has worked out of the original phenosafranine desensitising process whereby the drawback of the residual stain in the negatives is largely obviated. He adds formaline and soda sulphate to the desensitising bath and finds that the dye stain is then rapidly removed in the ordinary washing of the negatives and that the desensitising bath also keeps better.]

It has been but a short time since phenosafranine solution has been recommended for desensitising plates and films, and much has been said regarding this operation. Already other dyes have been discovered having similar properties and which may be superior to phenosafranine for the purpose. The one which seems to have the greatest promise for this purpose is pinakryptol green, the others have not proved as satisfactory generally as the phenosafranine.

The main objection to the phenosafranine bath has been its tendency to stain the plates or films severely, and this stain has been difficult of removal. Many attempts have been made to overcome this fault. These attempts seem to have taken the form of either finding other desensitising solutions with less staining tendency, or discovering some bath which would readily remove the stain, rather than the addition of some other substance to the phenosafranine bath to remedy this condition.

In reference to the method of putting the plates or films through another solution to eliminate the stain, this adds one extra operation, which should be avoided, if possible, and also the chemicals suggested usually have a tendency to soften the film, which, to say the least, is apt to be very annoying in hot weather.

The following method of preparing the phenosafranine bath eliminates practically all of the stain; what little stain is present is removed in the wash water or remains in such small quantity as to make no difference in printing from the negatives. Anyone who has tried the phenosafranine bath as usually recommended or sold commercially will immediately discover the slight amount of stain obtained with the bath as here recommended, which is made as follows

Stock Solutions.

A.	Phenosafranine (water soluble)	20 grs.
	Water	8 ozs.
B	Formaline, 37 per cent.	½ oz.
	Sodium sulphate, dry (Glauber's salt) ..	1 oz.
	Water to make	9 ozs.

To 9 ozs. of B add 1 oz. of A, to form the working solution *

This working solution should be used as a separate bath, and the plates or films placed in it one or two minutes before starting development. They may then be given a short rinse, and development and fixing proceeded with as usual. As this bath also has a tendency to harden the plates or films they should be removed in two or three minutes in order that they may not become too greatly hardened. On the other hand, this property is of great advantage in the summer time, as the films are conveniently hardened while being desensitised, and therefore do not soften in the developer, in the hypo, or in the wash water. For this reason no hardener is required in the fixing bath. The hardening in two or three minutes, due to the formaline, is not excessive, and films put through this bath over a year ago show no signs of deterioration.

When working as above indicated, the development is slowed somewhat, but the correct time of development may be readily determined by one or two trials, and to make certain of the developer acting with uniform speed the time that the plates or films remain in the desensitiser should be kept as uniform as possible. To avoid streaks which might occur, it is recommended that after the plate or film is removed from the desensitiser it be well rinsed for a couple of seconds, placed in the developer, and the developer immediately rocked or the film kept in motion for about half a minute in order to be sure that the developer is acting uniformly. This same procedure should be followed when placing the negative in the fixing bath.

When using orthochromatic emulsions, the plate or film may be developed within two or three feet of a W. & W. OO safelight, which is the safelight used for bromide paper. Panchromatic emulsions, such as W. & W. Panchromatic plates or Eastman Panchromatic film may be developed within the same distance of the same light provided a sheet of cardboard is interposed between the light and the plate, and the plate is kept in the shadow of the cardboard. While the plates and films may be developed in the light as indicated, some care should be exercised to avoid unnecessarily exposing them to the light. For this reason it is advisable to keep the tray covered part of the time. This is especially so in the case of the panchromatic emulsions, which are so extremely sensitive that a little extra care should be taken in handling them.

Another advantage of the desensitising bath is the fact that it eliminates to a great extent chemical fog due to the developer and also fog due to an unsafe light or unsafe dark room, as the desensitising starts as soon as the plate or film is placed in the phenosafranine bath. Because of this elimination of chemical fog and fog from an unsafe safelight, the negatives are much cleaner than is usually the case, and this is especially noticeable in the development of the panchromatic emulsions. For this reason alone, it is advantageous to use the desensitising bath with the panchromatic emulsions, even with the regular green safelight which is recommended for use with them. In my own experience I may mention that in developing panchromatic plates and films by tray, using the green safelight provided for the purpose, I not infrequently obtained fogged negatives, which I attributed to various causes, old emulsions, leaving the films too long in the plate holders, etc., but not once did I doubt the safety of the dim green light. In contrast to this state of affairs, I may say that since using the desensitising bath mentioned above I have obtained clean negatives free of fog, notwithstanding the fact that I have been developing the panchromatic emulsions with the tray close up to the dim green light provided for the purpose, and without covering the tray at all during the full time of development, lasting from three to seven or eight minutes.

Of course, the plates or films must be placed in the desensi-

* This solution is considerably stronger than that usually recommended. From the above quantities one pint of desensitising solution contains 5 grains of phenosafranine, while the usual strength is 1 grain per pint, or approximately 1 in 10,000.—Eds. "B.J."

tising bath in the dark or in a light safe for the plate in use, the brighter light being turned on after they have been in the solution for a minute or two. If the dark room is equipped with electric light a convenient method of working is to attach the safelight and the brighter light to a double socket, starting desensitising in the safelight and then turning on the brighter light. The objection may be raised that the plates or films must be started in the dark or by a weak light, and that being the case, they might just as well be developed in such light; but this objection is not well founded, as but little light is necessary for placing the plates or films in the dye bath, and the light is considerably brighter during the development of the image. Therefore the eye strain is considerably less in the inspection of the image, and the image may be more carefully inspected.

In order to avoid staining the fingers in the operation, it is advisable to handle the plates or films in clips or hangers and keep the fingers out of the desensitising solution. In practice this should present no difficulty.

Because of the hardening properties of the desensitising bath, the emulsion becomes tough and strong, permitting rough handling, eliminating hot weather troubles as already mentioned, decreasing the possibility of damage to the film, permitting the use of warm developers and developers with caustic or other strong alkali, and allowing the possibility of rapid drying.

Another objection to the regular phenosafranine bath as usually recommended is the fact that its keeping quality after once being used is not very good, as considerable mould often forms on it, necessitating filtering before further use; but with the formaline bath recommended above, the keeping quality is very good, and this may be used over and over again and kept indefinitely, simply adding more solution from time to time to bring the quantity up to the amount desired.

The advantages of the above desensitising bath may be summed up as follows:—

Desensitises plates or films, permitting development of panchromatic or orthochromatic emulsions in bright orange light.

Does not stain plates or films unnecessarily. No after treatment necessary.

Enables more accurate determination of time of appearance in factorial development.

Relieves eyes from severe strain of developing by weak light.

Enables better judgment as to whether negatives are over- or under-exposed, and amount of development necessary in each case.

Prevents fog from an unsafe light or unsafe dark room.

Contributes to prevention of chemical fog. Prevents hot weather troubles.

Enables use of warm or strongly alkaline solutions.

Toughens films, enabling rough handling with less possibility of damage.

Permits rapid drying of negatives. Keeping quality of solution is excellent.

A trial or two with the above method of procedure will readily demonstrate its merits and will probably result in its adoption.

H. G. Cleveland.

FERROTYPE WITH A FIELD CAMERA.

To convert the usual type of field camera into an efficient piece of apparatus for "while you wait" photography requires but a minimum of mechanical skill. With the aid of a few simple tools, and the help of a tinsmith for the metal parts of the apparatus, quite a capable job may be made. Such a camera made by the writer has been in use for the past two seasons, and has fully justified the amount of trouble expended upon its manufacture. The camera itself may be of either ¼-plate or ½-plate size; the writer's camera is ½-plate. The measurements given are intended for that size, but a ¼-plate camera may be easily adjusted for the work in a similar manner. The camera, however, must possess a wide angle movement, allowing the back to be pushed forward towards the lens, and clamped in this position. The baseboard therefore forms a platform upon which the box constructed for development, etc., rests. A short focus lens must be used, and one which is capable of giving good sharp definition over the small size of plate.

The box is the first portion to be made, and this is constructed of stout 3-ply wood. The base of this box is 8 ins. by 7½ ins., the narrower side being altered, if necessary, to fit into the back of the ½-plate camera. In my particular instance the camera back is 7½ ins. square The rear portion of this box B is of fairly stout wood. ⅜ in. thick, and has a U-shaped section cut out to allow the hand to be easily inserted into the box.

The top of the box is open along the sloping sides, as in fig. 2, with the exception of a strip C which extends across the top for the attachment of the twill covering. In the front of this box a circular opening is cut of 5 ins. diameter and a piece of 3-ply wood cut to fit exactly. Two other circular discs are cut, one 6 ins. diameter and the other 5½ ins diameter. In the centre of each of the discs a rectangular opening is cut corresponding to the size of the plate used and allowing a small rebate all round. In the present case the opening measures 2¼ ins. by 1⅝ ins.

The three discs are now fixed to the front of the box by screwing them together, but the smallest disc which fits in the circular opening is first covered with a thin piece of cardboard to make it slightly thicker than the box front. This allows a little play between the discs and the front of the box, and permits the discs to turn easily when in position. These discs are shown in section in fig. 2. The 6-in. disc which is inside the box has a notch cut out for a quarter of its circumference, and stops are affixed to the front board to allow the disc being turned over a right angle and so reversing the position of the plate.

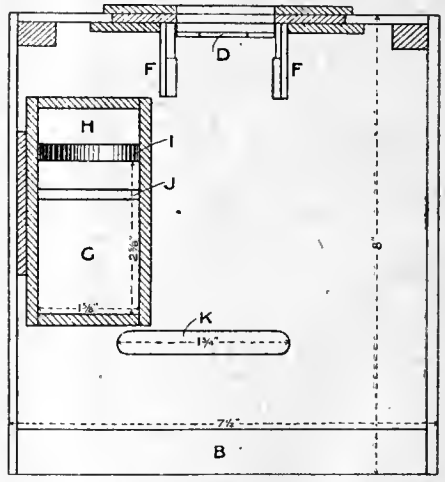


Fig. 1.—Plan. B, back of attachment with U-shaped portion cut away in centre. D, focussing screen and plate holder. F, metal plates holding focussing screen when folded back. G, magazine for plates. H, space for finger when removing plates. I, division with U section cut out. J, small strip of wood, to keep plates off bottom of magazine. K, opening to tank.

A focussing screen is attached to the rectangular opening by means of a metal frame to which a hinge is soldered. To allow the focussing screen to fit exactly into position one leaf of the hinge

is reversed, by removing the pin and turning the leaf round. The screen is shown at D. This screen is held by a clip E, and accommodates the ferrotype plate during exposure. On either side of the focussing screen triangular metal plates F are fixed. These

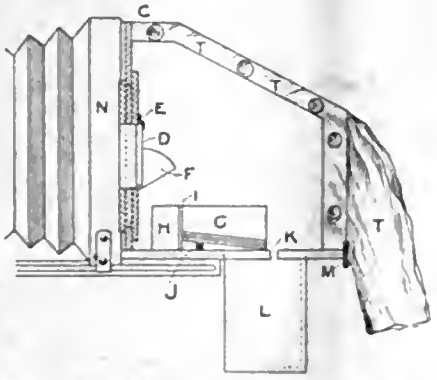


Fig. 2.—Side elevation. C, flat strip on top of box. D, focussing screen. E, clip for holding screen and plates in focal plane. F, metal plates for holding D when folded back. G, magazine. H, space for finger I, dividing strip. J, small strip of wood. K, opening to tank. L, tank. M, stop for tank. N, camera back. T, twill covering.

plates have rebates on the inner sides which hold the focussing screen when it is folded back to allow a plate to be inserted.

On the base of the box a small magazine is constructed to hold fifty plates. This is shown at G, and is made of 3-ply wood lapped at the joints to make a light-tight job. This box is 3¾ ins. by 1¾ ins. internal measurements, as shown in fig. 1, and the front portion H is left clear to allow the finger to be inserted when it is desired to lift out a plate. The dividing strip I has a U-shaped portion cut out from the top, reaching nearly to the bottom, thus allowing the edges of the plates to be exposed and easily lifted by the finger.

A small strip of wood J, ¼-in. square, is glued across the box to keep the plates off the bottom. A light-tight lid is made (with a hinge of thin leather or linen) to cover this plate magazine entirely. The lid is made fairly heavy, so that it will close automatically after a plate has been taken out. Slightly behind the plate box and in the centre of the apparatus is the slot K, which is 1¾ ins. long and ¾ in. broad. This communicates with the developing tank L. The tank consists of a 1-lb. glass jam jar, which is entirely encased in a tin lining, the flat top of this tin being extended ¼ in. on either side, with a slide of 3 ins. in front and 1 in. behind the tank. This is shown by the dotted lines in fig. 2 above the tank.

The glass jar is held in position by a rubber band round the upper portion which fits tightly in the tin case and so prevents movement. At right angles to the extension at the rear of the metal casing of the tank a stop M is fixed. This prevents the tank from being pushed too far in front of the slot K. The overlapping metal portion of this tank fits into a wooden groove screwed to the base of the box, and is securely housed to prevent entrance of light.

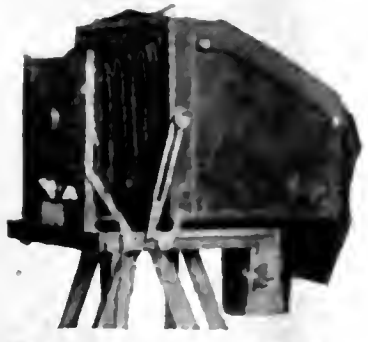


Fig 3.—Camera with attachment fitted.

The whole of the top portion of the box is now covered with a double thickness of black twill, as shown at T, fig. 2, an opening being made at the rear to allow the hand being inserted when putting the ferrotype plate into position. Drawing pins are shown along the top and side of fig. 2; these hold the twill in position and allow easy removal of the covering if necessary.

Focussing takes place by observing the screen through the opening at the back of the box, the platea being covered by the lid of the magazine during this operation. It may be necessary when converting one's own apparatus to alter the measurements slightly, but once the general idea of the attachment is understood, the actual making of the fitting will become quite simple. A photograph of the complete apparatus is reproduced in fig. 3, from which it will be noted that it is quite neat in appearance, while in actual use it is as simple as it is efficient.

C. J. Sims.

DESENSITISING IN ITS COMMERCIAL ASPECT.

(A note in the current issue of the "Photographic Journal.")

In a short paper which I read before the Pictorial Group a few months ago, I lamented the fact that photographers, generally speaking, lacked the experimental sense. Science progresses continually, but it is always a matter of some considerable time before the teachings of science are applied in actual practice. As an instance of this there is no better example than the thiocarbamide process in the development of lantern slides, long so ably advocated by Mr. Dudley Johnston, though the process was worked out many years ago by Dr. C. E. K. Mees.

Much the same thing is apparently taking place in the matter of desensitising prior to development. Careful inquiry among many of my friends leads me to suppose that, in spite of the publicity given to it in the Press, it forms a *terra incognita* to amateur and professional alike. This is not as it should be, for to the photographic worker nothing is calculated better to serve him than desensitisation applied as an essential part of his photographic routine.

When Mr. Storr, some two years ago, first demonstrated before an audience at the Royal the desensitising properties of phenosafranine, I realised that this gave the professional photographer in particular quite a new power in his operations, not only providing extraordinary convenience in working, but also serving to shorten very materially the time occupied in the development of large batches of negatives. I immediately tried the dye, and though the desensitising from the practical point of view is perfect, yet this particular dye has unfortunate staining properties which render its use inadvisable and, in my opinion, from the commercial point of view, impossible.

When a dye possessing such revolutionary properties as phenosafranine is discovered, it is hardly necessary to remark that science immediately sets to work to find other dyes having the same property, and in view of the enormous number of dyes at present known, it was only a matter of time before several others were found. One such dye formed the subject of an able article in the "British Journal of Photography," by Mr. R. E. Crowther, last July.

Mr. Crowther, in his article, dealt with the properties of three different dyes; and as from his remarks the third (Pinacryptol Green) appeared to be the best, with some difficulty I laid in a supply for a practical trial, the trial proving such a success that it caused me to institute quite a new dark-room routine from which now I should be sorry to depart.

The dye, as bought, is a metallic-looking powder, having something of the characteristic appearance of iodine. It is very readily soluble in water. Both the original instructions and Mr. Crowther in his article recommend a solution of 1 in 5,000 for use. Here let me remark that, through an oversight, I made up my first solution of just half this strength, and as I did not get the least sign of fog on the negatives, I have used it at this strength ever since.

Turning now to the practical side, I must refer at short length to the ancient method of development as practised in my everyday business. In this the 12 by 10 plate is the standard size, and they are used in very large numbers; it is quite an ordinary matter to find anything from nine dozen to a gross awaiting development in the afternoon. These were developed in a wooden dish four at a time, and development under these conditions is inclined to become intolerably tedious. Tanking them I found unworkable, though I tried hard to make it a success.

Pinacryptol Green, however, has changed all this. The dark-room sink now carries three tanks. No. 1 is the desensitising tank, Nos. 2 and 3 contain developer. These, with a dozen racks made to hold twelve 12 by 10 plates (which are spaced half an

inch apart), constitute the complete equipment, which, from the area point of view, occupies far less space on the sink than the old wooden dish.

Confronted with a batch of exposed plates, a rack is taken and filled with a dozen plates in a red light, and it is immediately placed in the desensitising bath for a minute. Bubbles adhering to the film in this bath were at first a nuisance, as this left small circles of film that were not desensitised. In this connection I found that dropping the cage of plates for an inch or so on to the bottom of the tank dislodged the lot, and the negative developed up free from the little circles of fog where a bubble had persisted.

After a minute in this bath a strong yellow light may safely be turned up, and the rack of plates is placed in the developing tank, and a second rack of plates can, if necessary, be desensitised in a similar manner. A third tank could of course be run, but personally I find that two developing tanks with 24 plates is as much as one can look after properly without slowing down the developer.

The light used for developing is a very strong yellow, using one thickness of the commercial yellow fabric only. The whole dark-room is flooded with light, so much so that it is easily possible to read small print in any part. The gain in comfort is incalculable, and as the negative can be watched most critically in all stages, it is possible easily to keep them very level in grade.

The negatives are absolutely free from fog, though the desensitising solution is only half the recommended strength. Panchromats, films and the usual run of studio negatives all go through the dye, and all respond just as readily.

I have not yet observed the least staining propensity of this dye; both the plate and the fingers are quite unaffected.

It may be asked after all this, "Where is the gain?" There is first the enormous saving of time; in my case the saving is in the proportion of one to five, *i.e.*, I find I can get through five times the number of negatives that I could under the old conditions. Then the brighter illumination of the dark-room is a boon only to be experienced once to realise what a comfortable place a dark-room may be under modern conditions; it is a boon worth almost as much as the incredible saving in time. Then again, as it is possible accurately to judge the density of a negative, it is easily possible to keep them of a very level quality—always a matter of considerable difficulty in the old days of shrouded gloom.

I am not claiming that desensitising is much of a help in cases where an occasional plate only is developed, but for anyone who is accustomed to develop plates in bulk it will be found to deprive photography of one of its worst horrors—the uncertainty and gloom of the dark-room.

A. C. Banfield, F.R.P.S.

Assistants' Notes.

Notes by and for assistants will be considered for this column. Payment for accepted contributions is made on the first of the month following publication.

Improvised Darkrooms.

It is in practice surprisingly easy to dispense with the formalities of the darkroom when the exigencies of circumstances make it necessary. The precautions which are quite rightly insisted upon at home may be ignored, when one is travelling and has to produce urgently wanted work at once, without appreciable harm.

In the course of the writer's experience he has frequently had to convert into temporary darkrooms rooms primarily intended for other purposes altogether. Bedrooms are usually the most easily converted, and here one is assured of almost unlimited privacy; but bathrooms and outhouses have also been utilised quite satisfactorily, subject to the permission of an amenable host. The arrival of darkness makes things easier, of course, but the exclusion of light from an ordinary room, sufficient for practical purposes, while the sun is shining brightly outside, has also been satisfactorily accomplished.

When it is remembered that the damage to a plate comes, not from reflected light, but from the rays that fall directly upon it, the problem is simplified. One may occupy a room outside of which is a street lamp, the light from which filters in even when the blind is drawn and the additional shield of a thick curtain or blanket provided. The risk of fog is in this case negligible, if development is carried out in the corner farthest from the window and the body interposed between the dish and the source of light. The developing dish must, of course, be covered throughout the operation, except for a few brief moments for inspection, and unnecessary exposure of the plate in any way avoided. Within these limits there are few buildings—even, as falls within the writer's experience, an old barn, which cannot be made light-proof after sunset.

Fortunately it is of rare occurence, but it sometimes happens that time presses to such an extent that to wait for nightfall is out of the question. The writer is thinking more particularly of newspaper work, where his experience has in the main been garnered. Many are the expedients to which resort is made in this case. It is often possible to discover a room—perhaps a cupboard—into which light has but one way of entrance, through the crack at the bottom of the closed door; or a room which can be rendered totally dark but for the window, which, however carefully sealed, admits a stray beam. A box should be obtained, and stood on end with the base towards the window. It will be found that development can safely be conducted in the interior of the box, the sides and one's own body sufficing to make it light-proof, the dish being covered as an additional precaution.

A mastery of the technique of time development is invaluable in the circumstances I have described. A watch with an illuminated dial should be a part of the equipment of every photographer. If it is lacking, the passage of time may be observed by retiring at intervals into a corner of the room and inspecting the face by the light of a carefully shielded match.

The devoted adherent to the inflexible rules of the comfortable, well-fitted darkroom will regard some of these details as little less than heresy. But they have to be practised on occasions, particularly by the pressman, and, granted reasonable care, they impair but little the quality of the resulting negatives.—G. F. W.

Photography inside Aeroplanes.

Having had occasion to photograph apparatus fitted inside aeroplanes of many kinds, some notes may be of service to anyone called upon to do the same. Owing to the inflammable nature of the machines, flashlight is ruled out entirely, however dark an interior may be, and it is an advantage to slip a piece of mirror into the camera-bag, to be used in reflecting a beam of light into dim corners.

The camera I prefer is of a light folding type, not larger than half-plate, as one requires depth of focus, but exposures are liable to be lengthy so that it is best to rely on enlarging from a fairly small plate.

Although not fond of the tubular tripod, for this work it has advantages, provided it is firm enough for the camera to be used. Its blunt points will not damage the canvas, of which there is a great deal, and the legs can be adjusted with little fear of slipping about as a wooden tripod does when the points are not pushed into something. Seldom can one obtain a level surface to stand the tripod upon, so that each leg may be on an entirely different plane if the camera is to be upright. Frequently it has been found necessary to tie the legs to any convenient projections, or even to do away with the stand and to lash the camera to some wires and cross bars with a large number of strings.

The attachments sold for clamping cameras to improvised stands are not much use, as there is so seldom anything just where one wants the camera, to attach it to. Individual ingenuity is a great asset in this work, as one can spend half an hour in tying strings, but the camera may be either still wobbling or perhaps be quite firmly pointing a little off the subject.

Focussing often is all but impossible. The method I used was as follows: Having measured the longest diameter of the subject it did not take much time to calculate what lens to use to get it well on the plate at the greatest available distance (this is always short) allowing room for the camera itself but not for the operator. One could usually allow an inch between the back of the camera and the wall, etc., or else arrange to have that inch temporarily and to push the camera right back after putting in the slide.

The camera was rigged up as well as the conditions allowed opposite the middle of the subject, and a pocket flash-lamp was laid on some outside bit of it. The image of the filament could be seen by placing a bit of mirror just behind the ground glass against the back wall. After a few jobs of this kind I purchased a dental mirror, *i.e.*, a tiny concave mirror fitted at an angle with a long metal handle, and this was found an acquisition not only for this particular work, but for many other cases of difficult

interiors in cramped quarters. This method enables the operator to stand beside the camera and still ensure getting his subject correctly "filled" on the plate. An outside spirit-level is sometimes necessary if the subject includes vertical lines. In cases where even the method of focussing described was not possible, one could measure with a piece of string the approximate distance from lens to subject and focus on a similar distance before placing the camera in position.

The "dope" and the general character of the subject render panchromatics essential, but the use of a filter is seldom practicable owing to the long exposures.

For photographing exterior details of planes one can usually get the use of ladders and portable platforms used in the hangers and occasionally a telephoto lens of the adjustable type is an asset for detail work. In any case it is advisable to arrange matters so that one does not stand, when exposing, on the same support as the camera.

The slightest movement will often start the plane or the platform swaying, though the wise photographer will have seen that the "bus" is jacked up before starting operations.

If there is included in the subject one of the small "propellors" used for generating current for the wireless set, it is a very good plan to insert a pointed match somewhere round the axle when no one is looking. These propellers have an annoying habit of giving a half-turn every now and then when one's back is turned. The wedge can be easily removed after exposure (surreptitiously if thought advisable).

D. Charles.

Exhibitions.

ROYAL PHOTOGRAPHIC SOCIETY.

A series of house exhibitions have been arranged by the Royal Photographic Society, and it is proposed to place upon the walls at 35, Russell Square, W.C., a continuous display of prints by prominent workers. The visitor will thus be assured of an interesting exhibit whenever he is able to visit the rooms, a point which will help, not only by giving prominence to the work exhibited, but by popularising the society itself. On Tuesday last the work of three prominent photographers was placed upon the walls. In the lower exhibition room some prints, "An Old Master of Photography," John Forbes White, taken somewhere about 1855, are on view. This collection was suggested by Mr. P. C. Tilney, who himself opened the exhibition. Together with these are hung a series of enlargements, coloured in pastel by Dr. D'Arcy Power. This latter process was described recently in our columns ("B.J.," September 22, 1922, p. 583), when Dr. D'Arcy Power demonstrated the process at Croydon.

In the upper exhibition room Mr. Frederick H. Evans has placed a number of his beautiful prints of Westminster Abbey on the walls. These are all platinotypes, a process which suits this type of work admirably, and allows the quality of the negative to record its beautiful gradation to the full. Mr. F. C. Tilney has reviewed the exhibits and his remarks will, we are sure, be appreciated by all who visit the exhibition.

* * *

An Old Master of Photography.

In the succession of exhibitions with which the R.P.S. animates its members there are occasionally collections of work which stand out as of supreme importance. Nothing less could be said of a show of prints made 67 years ago by a man of great reputation among scholars, an intimate friend of eminent painters, and an authority upon ancient and modern painting.

John Forbes White was a contemporary of D. O. Hill, whom he knew well. At the age of 24 he took up photography, the brilliant pictorial possibilities of which doubtless proved an irresistible lure to one whose life was a matter of art-impulses. For two years he worked, producing prints by the "waxed paper" method, a development of the calotype used by Hill. His subjects were chiefly architecture and outdoor views. A few of his negatives are on view, shown as transparencies. In its class his work is as strong and fine as Hill's.

Yet although everybody has heard of Hill, no one, photographically speaking, had ever heard of White before the good fortune that befell me of discovering this buried treasure. White's name does not occur in any book on photography, nor in any historical catalogue. The Crystal Palace Exhibition knew him not, although some prints appeared in the great Glasgow Exhibition. "But the whirligig of Time brings in his revenges." Making a call upon a neighbour in my village two or three years ago I was surprised to see a number of architectural photographs hung upon a staircase. "What are these; D. O. Hill's?" I asked. "No, they were done by Dr. White, of Aberdeen, in the old days." Such a find could not be permitted to go unrecorded in photographic annals, and I put the suggestion to Mr. Harrower, the photographer's son-in-law, that they should be exhibited. In due time this has been brought about, and I am not a little proud of having been the humble cause.

Judged by modern standards these works would be deemed poor photographs. They have no skies; they are not rich in half-tones; they are generalised into lights and darks, and what half-tone there is comes of fine admixture of the black-and-white elements, with a consequent granulation of texture. But those early methods, laborious, fortuitous, evil-smelling as they must have been, did produce pictures when the right man was behind the camera. And are modern camera pictures any better, for all their infinite subtlety of tone-differentiation which science has coaxed out of material by chemical research? What we have always admired in Hill—the downright light and shade aspect, such as a strong etching gives, in good hands—is seen equally in these other old works that are new to us. Their characteristic is virility, which embraces nevertheless a perfect delicacy. The interesting fact about the negatives is that they reveal much more detail and nuance than the prints show. The printing paper seems to have been responsive up to a point only; all below this degree of tone the paper seems unable to register, but all above it is precise enough. But this, as it happens, is exactly the method of the painter. So Velasquez looked upon his subjects. This is, in fact, the secret of the charm which lurks in the fine broad, impressive sheets of shade, that give such masculine design and effect to the works of this period, and possibly it was this fascinating "treatment," this truth to actual human vision, that appealed to Hill, the painter, and to White, the Encyclopædia Britannica authority upon Velasquez and Rembrandt.

That White felt and revelled in the richness of these generous shadows is obvious from the masterly effectiveness with which he built them into his compositions, as well as from the selection of the day and the hour when they should be most eloquent in sharp relief of sculptured detail and mere mural inequalities. Indeed, the quality of textures is one of the notable characteristics of the prints.

Apart from the fact of their antiquarian interest, the artistic fascinations they exert will make a strong appeal to those who aim at exploring the resources of photography as a pictorial medium.

Photographs by Frederick H. Evans.

After an absence of at least a decade from exhibitions, Mr. Evans's admirable work may come as a surprise to all but those who remember his triumphs in the past and have seen his output in the interim. The long series of views of the interior of Westminster Abbey are certainly a wonderful achievement. One can imagine nothing finer or more complete as a set of illustrations of the architectural, historical, and archæological aspects of the great cathedral. As records of structure and ornamentation, and even of the shafts of light which, in piercing the gloom century by century, may be regarded as permanent features of the vistas, these photographs are unsurpassed. There is scarcely an inch of carving or sculpture of any note that Mr. Evans does not attack, however remote or obscure it may be. Groining, "pendentives," lost in a lofty twilight to the normal eye, he illuminates and brings into view. Tombs that are hidden in murk and mystery start, blushing, into the adventitious limelight of his long exposures. We see all by the management of his magic, which is both telescopic and microscopic.

Over all he sheds the fascinations of his photographic quality, in making every shadow alive with detail and his thousand and one tones in infinite gradation—superb!

Mr. Evans, himself, speaks of these works as pictures. And in the sense that anything which depicts is a picture, they certainly are. But the elements of pictorialism do not lie very much on the road Mr. Evans chooses in these views; for they are in the nature of radiographs of the hidden anatomy of the fane. A discussion between a few friends on the opening night of the show, when Mr. Evans exhibited lantern slides of the views, raised these

points: What is the pictorial charm of the Abbey? Does it not lie in the very gloom which Mr. Evans dissipates? Does the eye, as it revels in the poetry and mystery of towering piers, see anything but a thrilling play of darkness and lightness? As soon as the enchanted beholder adjusts his vision from the broad responsiveness to the acuter searching of detail, he has finished with the picture, and become the antiquarian enthusiast or the connoisseur of carving.

But, said one gentleman, a man could see all the detail when his irides were sufficiently opened. Another observed that a camera in a coal-cellar would give every detail if the exposure were long enough, and if there happened to be the faintest modicum of light; but a man would first starve, and then rave, and finally die before he saw as much, and then it would matter little how much he had seen.

It seems to me to be a point of photographic ethics—this "exposing of the shadows" fetish—that is, if the *picture* is the thing, and not the *record*. Mr. Evans admitted that one tomb was in darkness; but he showed it as though transfigured by a lightening flash.

In a few of the exteriors, particularly of Durham, the pictorial aspect is easily established, because the exposure coincides more nearly with the normal eye receptiveness. These have the pictorial charm which, when the fortuitous concourse of circumstances exists which pure photography requires, no one can render more delightfully than F. H. E.

PHOTOGRAPHIC PASTELS.

A third exhibition consists of examples by Dr. D'Arcy Power of his method of treating the photographic basis of a print in such a way as to admit of the application of pastel work for a coloured effect His method has already been commented upon in these pages on the occasion of his lecture at Croydon. I very much liked the feeling and colour of a seascape, wherein the basis had certainly disappeared altogether. These house exhibitions remain open till the end of the month..

F. C. TILNEY.

PORTRAITS OF THE VICTORIAN AGE.

IT was a happy idea of Messrs. Elliott & Fry to mark the opening of their new premises at 63, Baker Street, by arranging there an exhibition of photographic portraits of notable people of the Victorian age taken at the "Talbotype Galleries," which were established in 1863. The exhibition, which includes 151 portraits, is a pageant of Victorian genius and fame. One lingers with exceptional interest before the many striking likenesses of men and women who played a leading part in the politics, art, science, literature, commerce and society of the last century, to name only some of the spheres of human endeavour which are here represented. The catalogue usefully states the year in which the portrait was taken, and it is interesting to look upon the boyish exuberance of the late Lord Northcliffe (104) of 1896, and mentally to contrast the present features of Mr. Lloyd George (131) with those which were less familiar to the public in what are commonly termed the "Limehouse days" of the ex-Premier. In one instance two portraits, taken at an interval of twenty years, are shown of the same personage, Dr. Joseph Parker, the former minister of the City Temple, who, in 1871, wore Kruger-like whiskers, which gave a grotesque appearance to his solemn features. But almost every portrait is of a man or woman who was a leading personality in one sphere or another. Together on the walls are Huxley, Tyndall and Herbert Spencer; Longfellow and R. W. Emerson near to them; Millais and Leighton; Walter Besant, Matthew Arnold, Mark Twain and Spurgeon. The politicians are here in great force —Gladstone, Cobden, Lord Salisbury, Labouchere, Joseph Chamberlain, John Bright and Lord Randolph Churchill. The portraits of Gilbert and Sullivan hang alongside those of Sims Reeves, Grieg, Liszt and Pachman; and the Royalties form a considerable part of the exhibition and include Queen Victoria and the present King and Queen when, respectively, Duke of York and Princess Mary. The student of costume will derive as much pleasure from the exhibition as will those who visit it for its portraits of the great ones of the past The fashions of the late Victorian period are evidenced in the many portraits of society women, and a few additional prints are shown illustrating the styles of dress which characterised the 'seventies of the last century. There must be very few people indeed who cannot find an hour's genuine enjoyment in visiting this exhibition, which is open free from 10 a.m. to 5 p.m. daily for some time to come.

We were particularly interested in inspecting privately an autograph album, kept by the late Mr. J. J. Elliott, in which had been inscribed the signatures of his innumerable sitters of note, accompanied in many instances with passages from their writings or some words of friendly greeting, also in the sitter's own hand. The volume forms a priceless souvenir of the history of the business, and must be a possession which is unique in the experience of photographers. But then it must be remembered that in the 'sixties and 'seventies of the last century Messrs. Elliott & Fry's premises were the rendezvous of many artistic and literary celebrities, and it was here that Charles Keene drew many of his "Punch" cartoons

Of Messrs. Elliott & Fry's new premises we hope to have an opportunity of writing at greater length at an early date, when photographs are available. No. 63, Baker Street, is next door to the house in which for sixty years the business of Elliott & Fry has been carried on. In fact, for the purpose of facilitating removal, a breach was made in the dividing wall, and much of the apparatus and stock conveyed by this route. The premises are unique among London photographic studios by their large dimensions and by the fact that all the apartments which the public enter are upon the ground floor. There are three large studios, numerous dressing rooms and business offices, in addition to three spacious exhibition galleries. It is the intention of Mr. Beaufort, the present head of the business, to set aside one of these for periodical exhibitions of the work of painters, etchers, or draughtsmen. The basement portion of the premises accommodates the numerous workrooms and the firm's stock of negatives, numbering upwards of two million. In addition, the basement accommodates the installation of the Photogravure Company, of which Messrs. Elliott & Fry are proprietors, and which is engaged in the production of photogravure reproduction of portraits. Even these claims upon the space of the lower part of the premises leave much room still vacant for the expansion of the business and for the addition of other branches, to which we will refer more particularly when writing of the premises from the photographer's standpoint. Here we must content ourselves with paying a tribute to the success with which Mr. J. W. Beaufort has advanced a business which has always been an institution in photography and which, under his continued direction, promises to eclipse its previous history.

FORTHCOMING EXHIBITIONS.

December 9 to 31.—Rochdale Amateur Photographic Society. Particulars from the Hon. Secretary, W. Lord, 10, Derwent Street, Rochdale.

1923.

February 5 to March 3.—Northern Photographic Exhibition, City Art Gallery, Manchester. Latest date for entries, January 12. Particulars from the Hon. Exhibition Secretary, Walter Johnson, 30, Hartington Road, Chorlton-cum-Hardy, Manchester.

February 10 to 24.—Scottish Photographic Salon. Particulars from the Secretary, George A. Ross, Northfield Cottage, Brechin.

March 1 to 8.—Birmingham Photographic Society. Latest date for entries, February 15. Particulars from the Hon. Secretary, J. E. Breeze, 178, Broad Street, Birmingham.

March 2 to 31.—Pittsburgh Salon of Photography. Latest date, February 5. Secretary, Charles K. Archer, 1,412 Carnegie Building, Pittsburgh, Pa., U.S.A.

March 13 to 16.—Exeter and West of England Photographic Exhibition. Particulars from the Hon. Secretary, R. W. J. Norton, 4, Buddle Park, St. Thomas, Exeter.

March 15 to 24.—Photographic Fair, Holland Park Hall. Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1.

AIRMAN KILLED WHILE PHOTOGRAPHING.—An attempt to "shoot down" another aeroplane in mock combat was said at the inquest last week to have caused the death of Flight-Officer William James Gayes while flying at Warden, Kent. Gayes was using a "camera-gun," which, when the trigger is pressed, instead of firing a bullet, photographs the object at which it is aimed, and shows if the shot would have struck. The theory was advanced that, after diving 2,000 ft., he kept the nose of his machine depressed too long, and struck the tail of the other aeroplane. A verdict of accidental death was returned.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications November 27 to December 2 :—

NEGATIVES.—No. 32,988. Production of photographic negatives. A. G. Clark.

CAMERAS.—No. 32,937. Photographic cameras. J. A. Leemann.

APPARATUS.—No. 32,884. Gyroscopic stabilisation of cameras, etc. Sir J. B. Henderson.

APPARATUS.—No. 32,820. Photographic apparatus for use with roll-films. A. Huber and W. Simons

APPARATUS.—No. 32,938. Apparatus for projecting and viewing colour photographs. J. A. Leemann.

X-RAY PHOTOGRAPHS.—No. 32,850. Taking Röntgen pictures for medical, etc., purposes. J. F. Freund

CINEMATOGRAPHY.—No. 32,599. Treatment of cinematograph, etc., films. W. C. Jeapes.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

SINGLE PICTURE STEREOSCOPIC CAMERAS.—No. 188,093. (August 13, 1921.)—The invention provides two pairs of prisms for each lens, the separate prisms of each pair being mounted on axes arranged at right angles to the path of the rays of light whilst each of the prisms is capable of being turned separately and independently on its axis. An anastigmatic lens is arranged in front of the film, this lens being adjusted independently of the prisms. The prism, which is disposed between the lens and the pairs of prisms for conducting the rays of light along convergent lines to a focus on the film, is adjustable for focussing the camera. The camera casing of the improved construction is shown at 1 having projecting mountings 2 for lenses 3. The irises 4 are arranged for dependent opening and closing by connecting their operating arms 5 to a rod 6.

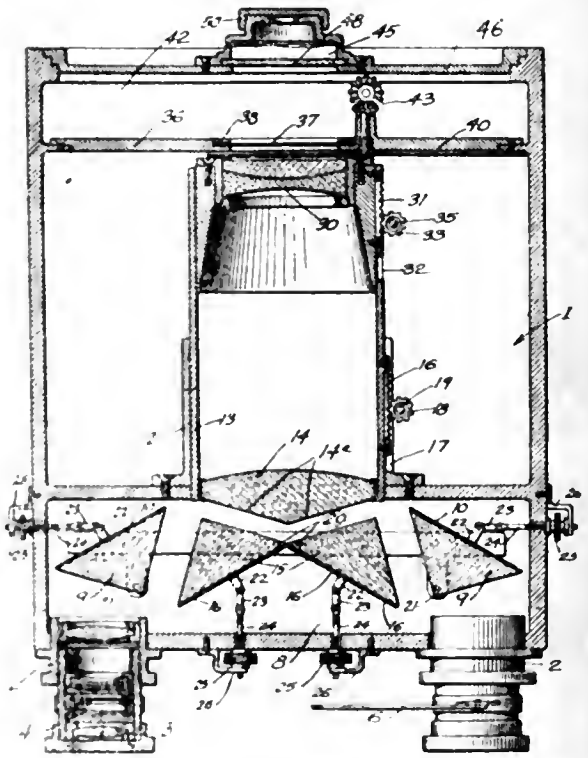
The lenses are in the same horizontal plane and are transversely spaced and arranged to focus upon a common object. The light passing through the lens structures enters a transverse chamber 8 within the camera casing, and prisms 9 are arranged within chamber 8 in alignment with the respective lens structures. The prisms are provided with reflecting backings 10 and bend the rays of light projected through the respective lens structures toward one another.

A guideway 12 extends from chamber 8 midway between prisms 9, and a mounting 13 carrying a prism 14, slides in this guideway. Prisms 15 are arranged in chamber 8 between each of the prisms 9 and the prism 14, and are formed with reflecting backings 16 and so arranged that the rays of light from the respective prisms 9 will be bent toward the prism 14. The prism 14 is provided with angular surfaces 14a at the side toward chamber 8, and against which the rays of light from the respective prisms 15 are received. The prism 14 is so arranged as to bend the respective sets of rays of light, and these, projected along convergent lines beyond prism 14 and through the mounting 13, come to a focus on a film 37 after passing through a lens 30.

The prism mounting 13 is adjustable in guideway 12 in order to position prism 14 properly. This adjustment may be accomplished by means of a rack 16 upon the mounting 13, and projecting through a slot 17 in the guideway 12. The rack is engaged by a gear 18 upon an actuating shaft 19, which may be provided with a suitable head. The prisms 9 and 15 are pivotally mounted upon rods 20, through bearings 21 in chamber 8, and the pivotal mountings for the prisms are so arranged that the latter may be relatively adjusted in order to bend the rays of light from the lens structures through prisms 9, and thence through prisms 15, so as to be finally projected against the respective surfaces 14a of the prism 14.

Hand operated means are provided for independently adjusting prisms 9 and 15, and for this purpose arms 22 extend beyond the reflecting backings of the prisms and are connected by links 23 to screw rods 24, through openings in the camera casing and provided with nuts 25, which are held in position by means of brackets 26. At the rear end of mounting 13 through which the two sets of rays of light are projected along common lines, an anastigmatic lens 30 is provided, the lens structure being slidable within mounting 13. This lens structure may be adjusted by means of a rack 31 extending through a slot 32 in the mounting 13, and having a gear 33 engaging the rack. The gear is mounted upon a shaft 35, which is provided with a head.

Beyond the lens structure a transverse partition 36 is arranged, and a film strip 37 is adapted to move past an opening 38, which is in alignment with the lens structure 30 in order that the rays of light projected through the latter will be received against the film strip. When the camera is employed for motion pictures,



the film strip is moved by the usual mechanism, and the shutter 40 is mounted in partition 36, so that in rotation it will pass between the lens structure 30 and the film strip 37. When such a shutter is mounted in the camera, a space 42 is provided in the camera casing in rear of partition 36, and the usual driving connection 43 is arranged in this space and extends beyond the camera casing.

A sight opening 45 is provided in the camera casing in the rear wall 46, beyond the film strip 37. The sight opening carries a ground glass 48 so that before the film is in the camera, or when the same is drawn aside from opening 38, an image will be formed upon the ground glass which may be observed through the sight opening for the purpose of setting the camera in the required direction for photographing the object. The sight opening may be closed by a cap 50, when the camera is in use.—Dr John Carl Wichmann, 115, Frazer Avenue, Ocean Park, Los Angeles, California, U.S.A.

The following complete specifications are open to public inspection before acceptance :—

LIGHT SENSITIVE COATING.—No. 189,433. Light sensitive coating. Wadsworth Watch Case Co.

CAMERAS. Nos. 189,438 and 189,439. Folding photographic cameras. Baille Lemaire et Fils.

FOCUSSING DEVICES. No. 189,440. Focussing devices for photographic cameras. Baille Lemaire et Fils.

FILMS.—No. 189,444. Treatment of photographic films and apparatus therefor. Counsell Film Process & Chemical Co., Ltd.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

SEPTON.—No. 430,290. Photographic chemicals, photographic plates and photographic films (sensitised). Johnson & Sons, Manufacturing Chemists, Ltd., 23, Cross Street, Finsbury, London, E.C.2, chemical manufacturers. October 7, 1922.

MARKS PLACED ON THE REGISTER.

The following marks have been placed on the register :—

THE KEY TO SUCCESS (BULLDOG-WORLD DESIGN).—No. B425,574. Photographic papers. Kappa Works, Ltd., Mogden Lane, Isleworth, Middlesex, baryters and manufacturers of photographic papers.

VELOPHOT.—No. 427,299 Photographic apparatus included in class 8. "Velophot" Erzeugung und Vertrieb Photographischer Neuheiten Gesellschaft mit Beschränkter Haftung, Concordiaplatz 4, Vienna 1, Austria.

New Books.

Discoveries and Inventions of the Twentieth Century. By Edward Cressy. London: Routledge. 12s. 6d. net.

MOST of the chapter headings of this handsome book of 460 pages mark the development of invention in the last century. Steam power, electric lighting and furnaces, railways, steamships, coal gas, motors, cold storage—these are among the triumphs of the inventor which revolutionised the habits of the civilised world during the Victorian age. Nevertheless Mr. Cressy justifies his title, for he has seldom had to cross his frontier line of 1900 for the rich material which forms his story of what the engineer, the chemist and the electrician have done during recent years. His crowded and well-written pages show the immense activity in the great branches of industry during the past twenty years, and not industrial inventions only, but scientific discoveries such as those of the physical chemist, which are changing our view of matter. For the most part his subject lies in the commercial sphere, manufacture, engineering, aerial transport and wireless telegraphy, modern agriculture and the revival of water-power, in addition to the subjects we have already named. His chapter on photography briefly glances over colour processes (where he goes astray on a minor point by including the Warner-Powrie among "commercial" colour plates), cinematography, and the use of cinematographic and other photographic methods in the analysis of the travel of projectiles Photographers, perhaps, will find more of fresh interest to them in the very excellent descriptions of the most modern patterns of electric lamps, arc, incandescent, and mercury-vapour. The book is indeed an admirable non-technical account of the chief industrial developments of the present century, described in a way to make it of value to adult students and also of interest to boys, for whom it makes a most commendable gift.

The American Annual of Photography, 1923. Edited by Percy Y. How. New York: George Murphy. 1.75 dollars.

THE 1923 volume of the "American Annual" leads off with a new feature, and a very good one, in the shape of a review of photographic progress during 1922. This is written by Carroll B. Neblette, who, within strict limits of space, provides an exceedingly useful résumé of the original work which has been done in sensitometry, colour sensitising and desensitising, emulsion grain, developers and development and printing processes. Mr. Neblette commendably gives references to the original places of publication of the papers and articles which he summarises. His contribution thus gives a more permanent value to the "Annual," the literary contents of which has usually been of a somewhat ephemeral kind, if we may use that description without offence to those who have made its pages the vehicle for their various experiences in photographic processes. Their articles are not by any means to be despised, yet the publication needed some more extensive survey, and it is precisely this which Mr. Neblette has provided. Notable among the practical articles are several on Carbro, including one by A. C. Braham. Bromoil difficulties occupy one contributor; H. F. Raes gives formulæ for extra-rapid fixing baths, by use of ammonium chloride; Dr. M. G. Lovelace describes his practical experience of desensitising with phenosafranine; A. Krug recommends addition of alcohol to the sepia toning bleach, and amateurs with little accommodation for their work will be interested in the photographs and specification of a kitchen cabinet for holding photographic requisities and convertible into a work bench for developing and printing. A selection of the formulæ for developers, toning solutions, etc., current in American practice, occupies the final pages of the book, together with tables of weights and measures, diaphragm numbers, and a directory of photographic societies in the United States. The text is lightened by a great many reproductions of photographs aiming at pictorial quality. Many of these no doubt provide incentives to the beginner, but we cannot help thinking that, in the selection of works for reproduction, better use could be made of the excellent paper and printing which characterise the volume as a whole. The book is issued also in a cloth edition, price 2 dollars 50, and is obtainable from Messrs. George Murphy, 57, East Ninth Street, New York.

New Materials.

Septon Sepia Toner. Made by Johnson & Sons, Cross Street, London, E.C.2.

THIS new sepia toning solution, which has just been put upon the market by Messrs. Johnson, provides an alternative to the old methods of toning bromide and gaslight papers, while very much simplifying the process. By one simple operation the black silver image is changed to a rich brown or cool sepia, the colour depending upon the make of bromide or gaslight paper. It is found in practice that gaslight papers tone to a richer colour than bromides. The solution, which is sold in 1-oz. bottles, is very concentrated, each bottle making 1½ gallons of toning solution. For use, 10 minims of the concentrated solution are added to 5 ozs. of water, which should be at about 75 deg. F. The dry print is immersed in the solution at this temperature. Toning takes place at a moderate speed; we find that a good cool sepia tone is produced in about 10 minutes.

The solution deposits a very fine yellowish-white precipitate, but this does not seem to affect the toning properties of the solution. No appreciable reduction of depth in the printed image is noticed beyond the fact that the colour is changed from black to a slightly warmer one, and photographers who are in the habit of using a hypo-alum bath which has been correctly ripened, need make no difference in the depth of their bromide or gaslight prints. The solution appears to be some sulphur compound, as it has a slight odour of sulphuretted hydrogen, but this is in no way objectionable and does not at any time during its use approximate the usual intensity of a solution of sodium sulphide.

It is suggested by the makers that toning should be carried to completion in the solution, since if the prints are removed before this stage is reached, toning proceeds in washing and drying until the final result is complete reduction of the black silver to the warmer-toned product. But as different makes of paper tone to different degrees of sepia, it may be easily found by experiment which paper gives the tone desired. One make of bromide paper which we have used in this toning bath gave a fine cool sepia colour in 10 minutes at 75 deg. F., while another make of paper gave, under the same conditions, a very pleasing warm black tone. We feel certain that the "Septon" toner will be welcomed by photographers, as it at once does away with the usual messy and strongly-smelling processes, while giving tones equally as pleasing and in every way as permanent. The solution is put up in 1-oz. bottles, neatly packed in cartons, together with full directions for use, price 1s. 4d. net, or in half-pint bottles 6s. net.

SEEING BY WIRE.—A Reuter telegram from Paris says that M. Edouard Belin, the inventor of phototelegraphy, introduced on December 6 a process of seeing by wire, a process in which there may be photographic opportunities. He demonstrated the possibilities of seeing at long distance by means of a telephone wire. His invention, he explained, is based on the unique property of selenium of varying its resistance to electric current according to the degree of light to which it is exposed.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Monday, December 18.

Birmingham Phot. Art Club. "A Cycle Tour in the Wye Valley." J. O. Wilkes.
Bradford P.S. Members' Demonstration and Lecturette Night.
Derby P.S. "How I Make My Lantern Slides." J. Shaw.
Dewsbury P.S. "Amateur Photographer and Photography" Prize Slides.
Forest Hill and Sydenham P.S. "Ramble Round Dorking" A. H. Redman.
Glasgow and West of Scotland Amateur Photographic Association. "A Bird Lover with a Camera." G. W. McAllister.
Kidderminster and District P.S. "A Trip to Paris." A. Brooker
Southampton C.C. Judging the "Skyscape" and "Grey's Elegy" Competitions.
Wallasey Amateur P.S. "Bromoil." C. M. Hamilton and T. Steel.
Walsall Phot. Soc. "Lecturettes" Competition by Members.
Willesden Photographic Society. "Flashlight." S. C. Hall.

Tuesday, December 19.

Royal Photographic Society. "Gravure." Henry T. G. Meredith.
Birmingham Photographic Society. Criticism Evening.
Bournemouth Camera Club. Instructional Evening. J. Thomas.
Burnley Mechanics' Institution C.C. Members' Print Criticism Evening.
Exeter C.C. "A Tour in Normandy." F. Corbett.
Hackney P.S. "Lantern Slides: Ancient and Modern." R. H. Lawton.
Halifax Scientific Society. "Enlarging." H. P. Kendall.
Maidstone and District P.S. "Vitegas." W. A. Brewster.
Manchester Amateur Photographic Society. "Exhibition Slides."
Morley Amateur P.S. "Natural Colour Photography." J. W. Dawson.
Nottingham and Notts P.S. "Psychology in the Studio." C. P. Crowther.
Portsmouth Camera Club. "Toning Processes." R. Parker.
South Glasgow Camera Club. Blue Book Night.
Wolverhampton P.S. "Paget Colour Photography." H. Rushton.

Wednesday, December 20.

Birkenhead Photographic Association. Question Night.
Borough Polytechnic P.S. "Modern Negative Making." M. B. Fleming.
Croydon Camera Club. Affiliation 1922 Competition Lantern Slides.
Edinburgh Phot. Soc. "Lantern Slide Making." G. W. Wight.
Partick Camera Club. "Molehills in Manipulation." W. S. Blair.
Rochdale P.S. "Picture Making by the Bromide Process." T. H. Greenall.
South Suburban and Catford Phot. Soc. Members' Evening

Thursday, December 21.

Coatbridge Phot. Assoc. "Our Outings." R. Naismith.
Edge Hill C.C. "Kosmos Self toning Paper." T. N. Langton.
Gateshead and District C.C. "Through Shakespeare's Country with a Cameo Camera." W. Butcher & Sons, Ltd.
Hammersmith Hampshire House P.S. One Man Show. A. C. Banfield.
Kinning Park Co-op. Soc. C.C. Glasgow and District Union Portfolio.
Letchworth C.C. "The Way of the Lovely Sky." A. G. Buckham.
Liverpool A.P. Assoc. "Psychic Photography." A. J. Stuart.
North Middlesex P.S. "Over the Gemmi to the Valley of the Rhone." W. Sanderson.
Richmond Camera Club. 1922 Affiliation Prints.
South Glasgow Camera Club. Whist Drive.
Sunderland Phot. Assoc. "Enlarging." J. Walton

ROYAL PHOTOGRAPHIC SOCIETY

Meeting held Tuesday, December 12. Mr. E. W. Mellor in the chair.

The meeting was under the control of the scientific and technical group, and two papers were read. The first, by Mr. A. S. Newman, described the N.S. Cinematograph Camera and an electric drive. Mr. Newman said he had long made a study of the theories of inertia and momentum, and he decided, when constructing his camera for cinematography, to put these studies to practical use. In cameras of this kind it was well known that a film had to be moved from a still position and stopped again so that a picture could be taken. The two effects had thus to take place in a very short space of time; for instance, in the camera in 1/30th of a second, and in the projector in 1/100th of a second. The earliest cinematograph cameras were made to take only 75 feet of film, while the present-day type would take 400 feet. The difficulties of the camera man were very great, and the lecturer felt that anything that could be done to lessen the number of items that each operator had to think about, and probably do, would be a move in the right direction, and would lead to the making of better pictures. Pictures often had to be taken against time and with a fussy producer, nervous actors and indifferent electricians. Cinematograph camera operating was a nerve-racking job.

The essentials of a perfect camera are that it should be practical, reliable and automatic. It should be light in weight, small in size, and particularly not liable to warp or change under varying conditions of heat or cold. The camera should also be easy to drive, focus and adjust, while freedom from vibration was of great importance. Indicator scales should be in a convenient position and easily read, while it should also be possible to change from one lens to another in the shortest possible time.

All these points had been embodied in the "N.S." Cinematograph Camera, and the fact that this apparatus had been used upon the Mount Everest expedition, under the most trying of conditions, spoke volumes for its efficacy. The body and all the non-wearing parts of the camera were made of Duralumin, a combination of aluminium and zinc, which was not affected by sea air. All parts were machined from the wrought, no castings being used. A special feature of the fitments of the camera was the indicators for iris of lens, focus and film measurement, all of which were located on the back wall of the box. It was quite possible to tell from the film indicator exactly which picture area of film was actually being exposed, and this out of a length of 400 feet. The fade mechanism of this apparatus, so important nowadays, was made to work in either 5 feet or 10 feet, while fading in or fading out could be obtained.

For focussing a reflex mirror with tubular eyepiece was provided. This fitting was attached by means of a slotted groove to the side of the camera, and when the mirror was in position the film-changing gear was locked. This prevented many feet of film being wasted. The mirror was of speculum metal, reflecting approximately 85 per cent. of the incident light, and was found of great durability. Different eyepieces were provided, one reaching to the back of the camera, and using a double reflex system allowed the camera to be placed in any position and focussing to be effected with considerable ease.

An interesting feature of the camera was the cam adjustment of focussing and stopping down the lens. Two gears were provided for lenses of different focus, yet the scales engraved on the camera back would suit each lens. The film was moved forward by a claw movement, an improvement upon a system invented by the lecturer in his school days. This movement was particularly clean and reliable, and one claw only was used. The gate pressure, used in most cameras to stop the film, was in this case particularly light, it only being necessary for this fitting to flatten the film while the exposure was being made. The threading-up of the film, always a difficult job, had been much simplified in the "N.S." camera, a special hardened brass carrier of intricate design being used.

The motor drive for the camera, described by the lecturer as the operator's third hand, consisted of a small specially designed 8-volt motor, which was attached by simply sliding it into a slot. The gear of the motor then engaged the gear of the camera, and upon connecting up with the source of electricity the camera could be worked at any desired speed. A control box, which allowed the operator to be some distance from the camera and to know, by means of a delicate galvanometer, if the motor was working correctly, was shown, and the camera was driven from some 60 feet distance by simply pressing a button. This was of great use to travellers and explorers, who would probably have to place the camera in a dangerous position while themselves seeking protection in a neighbouring tree. Upon the proposition of the Chairman a very hearty vote of thanks was accorded to Mr. Newman for his able lecture and demonstration.

The second paper, "The Factors Which Govern Gamma Infinity," by Messrs. G. I. Higson and F. C. Toy, was then read by Mr. Toy. Much experimental work had been done, and was still progressing upon this elusive property. The points which effect the maximum density of a plate were fully discussed. The larger grain of silver halide was more sensitive than the small, while it gave greater

density upon development. Developers themeslves changed the figures obtained, hydroquinone giving a higher gamma than metol.

The gamma figure of a plate could be roughly determined by microscopic examination of the unexposed silver emulsion. Small grains, very uniform, were found to give a high gamma of 3.5 to 4, and even upwards; large grains, uneven in size, a gamma of from zero to 1.5, while two intermediate cases of large uniform grains and small uneven grains gave a figure of 1.5 to 3.5.

In the discussion which followed, Mr. Olaf Bloch exhibited micro-photographs of an emulsion he had prepared and which had afterwards been physically effected. The grain of silver halide was of equal size in both emulsions, yet one had an H. & D. figure of 9 while the physically treated emulsion had a figure of H. & D. 178.

A vote of thanks to the authors of the paper, and also to Mr. Toy for his reading, was proposed by Mr. Olaf Bloch and heartily approved by the audience.

CROYDON CAMERA CLUB.

A lantern-lecture on the "Passion Play" at Oberammergau was given by Mr. F. Ackroyd, who dealt with his subject in very tactful way. For once the ever-prevailing spirit of levity in the club was stilled, and all listened with attention and interest to his graphic account of this wonderful representation of the great sacred drama. Very clearly he conveyed the traditional earnestness and high ideals that inspire the performers, who are mostly peasants and wood-carvers.

The absence of any commercial spirit, he continued, was notable. A huge sum was offered for the right to film the play, and a tempting bid was made for the transfer of the company to give performances in the U.S.A., but both offers were declined.

The "Passion Play," he said, originated in the middle of the 17th century, and is given every ten years from May till September. It suffered interdict at times, and interruption during the Great War. A hearty vote of thanks was accorded Mr. Ackroyd.

EDINBURGH SOCIETY OF PROFESSIONAL PHOTOGRAPHERS.

Meeting held December 4. Present:—Mrs. Mackay, Miss Bertram, Miss Grace D'Arcy, Mr. J. Campbell Harper, Mr. J. B. Johnston, Mr. George Balmain, Mr. George Aikman, Mr. William Fergusson, Mr. Norman Thomson, Mr. E. D. Young, Mr. John Thomson, Mr. A. J. Hughes, Mr. Swan Watson, Mr. Yerbury, Mr. George Ayton, Mr. John C. Bambrick, and Mr. W. J. Hutcheson. Mr. J. Campbell Harper, president, in the chair.

The meeting discussed the desirability of holding an exhibition of photography in Edinburgh. It was felt that an exhibition would be sure to give a great stimulus to photographers in Scotland, and lead to a revival of business. Mr. Young, seconded by Mr. Yerbury, accordingly moved that an exhibition be held for two weeks, from March 19, 1923, in the Hall of the Society of Eight, Shandwick Place, and this was unanimously agreed to. The secretary was instructed to secure the hall at a rent of £15 per week, which sum would include the cost of lighting, heating and attendance of the caretaker. The following committee were chosen to carry out the arrangements:—Mr. J. B. Johnston, Mr. E. D. Young, Mr. Yerbury, Mr. George Ayton, and the president. The meeting, after considering the subject, made the following specific recommendations:—That all spaces are to be balloted for; that the spaces should be of equal size, and no exhibitor have more than one space; that the floor line be restricted to 2 ft. 6 in. and the height to 5 ft. 6 in.; that the exhibits be glazed, and that passe-partout or wooden frames, not exceeding ½ in. in breadth, be used. With these recommendations, the committee were given full powers to carry through the arrangements. It was agreed that notification should be sent to each exhibitor of the space allotted to him, and a request for payment of £3 3s. towards the expenses in connection with the exhibition.

The meeting agreed to hold an assistants' social evening, with whist drive and dance, on Monday, February 5, 1923, and afterwards considered the estimates submitted by the committee. Mr. George Balmain, Mr. Norman Thomson and Mr. Fergusson were appointed a committee for carrying out the arrangements, and Mr. Bambrick was co-opted as a member of this committee to arrange a musical programme for the evening. It was agreed that the masters should pay for each assistant, the other expenditure to be paid out of the Society's funds. It was arranged that each member should communicate with the secretary the names and addresses of each assistant in his employment, so that formal invitations could be sent to them direct.

Commercial & Legal Intelligence.

NEW COMPANIES.

JONES (BECKENHAM), LTD.—This private company was registered on December 6 with a capital of £500, in £1 shares. Objects: To acquire the business carried on at 5, Rectory Road, Beckenham, and to carry on the business of opticians, dealers in photographic supplies, etc. The first directors are: W. Ault, 58, Glenalmond Road, Sheffield; S. E. White, Peasedown St. John, near Bath. Qualification: 1 share. Registered office: 5, Rectory Road, Beckenham.

CRANE, PAGET & CO., LTD.—This private company was registered on December 6 with a capital of £3,000, in £1 shares (500 "A" preference, 2,000 "B" preference, and 500 ordinary). Objects: To carry on the business of photographers, etc. The permanent directors are: L. Teller, 161, West End Lane, Hampstead, N.W.: M. E. Balcon, 15, Sutherland Avenue, W.9. Qualification: £10. Remuneration: £300 per annum, divided between them. Secretary: J. Freedman. Registered office: 17, Cork Street, Burlington Gardens, W.

GEORGE ODELL, LTD.—This private company was registered on December 5 with a capital of £3,000, in £1 shares. Objects: To acquire the business of an optician carried on by G. Odell, of 31, King Street, St. James's, S.W., and to carry on the same and the business of dealers in photographic and mathematical instruments, etc. The first directors are: G. H. Odell, The Primrose Club, Park Place, St. James' Street, S.W., ophthalmic optician; A. H. Odell, 15, Dames Road, Forest Gate, E., ophthalmic optician's assistant Qualification: 1 share. Registered office: 31, King Street, St. James's, S.W.

News and Notes.

PATENTEES' COURT OF ARBITRATION.—The Institute of Patentees have set up a Court of Arbitration, to which disputes between inventors, patentees and manufacturers may be referred.

NORTHERN PHOTOGRAPHIC FEDERATION.—The twenty-first annual meeting was held in Newcastle on December 6. There was a large attendance of delegates. The annual reports showed that the Federation was in a strong position. Six new societies had joined during the past year, the number of societies now federated being 23. The list of lecturers and demonstrators showed a considerable increase. The present list contained 30 lecturers and 47 subjects. It was decided to re-issue the Federation year book, which will provide a valuable guide to camera users in the North. Mr. T. Spark, of Bishop Auckland, was appointed editor. It was also decided to hold an outdoor meeting in Durham during next summer.

On the election of officers, a letter was read from Mr. Wm. Milburn, of Sunderland, resigning the position of President, which he had held for the last 12 years, and thanking all for the support which they had given him during his term of office. On a motion from Mr. B. Redford, it was unanimously agreed that Mr. Robert Chalmers, honorary secretary for the past ten years, be elected to the position of President. Mr. J. W. Addison, another prominent Sunderland worker, was elected honorary secretary. The following officers were also elected:—Chairman, Mr. T. Spark (Bishop Auckland); Treasurer, Mr. Robert Simpson (Stanley); Competitions Secretary, Miss A. C. Flagg (South Shields); Travelling Exhibition Secretary, Mr. H. Burgess (South Shields).

GLASGOW AND WEST OF SCOTLAND SOCIETY OF PROFESSIONAL PHOTOGRAPHERS.—On the evening of Wednesday, December 6, 1922,

a whist-drive was held by the members of this Society in Miss Rombach's Rooms, Hope Street, Glasgow, when a large company assembled. Progressive whist was engaged in, and, after refreshments had been served, a musical programme was provided by the committee having charge of the function. The evening was greatly enjoyed by all. A syllabus has been issued by the Society for the session 1922-23. This will serve the members as a ready reminder of the various meetings during the winter. We observe from the syllabus that representatives from Kodak, Ltd., have already this year delivered lectures to the Society on "Spot Lighting, Diffusion Discs, etc," and on "Printing Papers," and Mr. S. J. G. Chipperfield, of Vernon & Sons, advertising contractors, on "Publicity in Photography." Other items in the syllabus include a lecture by Mr. C. Pollard Crowther, F.R.P.S., of London, on "The Making of Portraits," a visit to the Glasgow Art Galleries under the guidance of the Curator, Mr. T. C. F. Brotchie, F.S.A. (Scot.), a whist drive, smoking concert, outing, etc. The Society appears to be having an active career, and it is to be hoped that the efforts of the committee and members, in addition to making for sociability and good feeling amongst them, will be helpful to business.

International Salon of the Pictorial Photographers of America.—For many years there has been a demand for a representative photographic salon in New York—a demand logical, not merely from the location and size of the city, but also on account of its importance as an art and photographic centre, and as a magnet for country-wide visitors in search of what is newest and best. With the institution of the Art Centre, and through its generous co-operation as a whole, the Pictorial Photographers of America, one of the founding and component organisations of that body, are enabled to announce an International Salon, to be held at the Galleries of the Art Centre, 65, East 56th Street, New York City, throughout the month of May, 1923. These Galleries are convenient of access, and are located in what has come to be the artistic nucleus of the city, and furnish ample, suitable, well-lighted space for an exhibition, if the entries warrant, of several hundred prints. Every effort will be made to secure representative foreign photography, as well as a collection of the best American work. In view of the importance which naturally attaches to this event, and which we shall aim in every way to signalise, we urge the early and earnest co-operation of all pictorial workers throughout the world. The jury of selection will be announced in advance of the exhibition. Consideration of all pictures will be deliberate and impartial. Acceptance will be restricted to work combining high artistic excellence with perfection of technique. Entry forms, with precise data, will be distributed at an early date. The chairman of the salon is Wm. A. Alcock, 44, Wall Street, New York City, and its secretary, C. W. Harting, 51, West 10th Street, New York City.

£3,000 Competition.—The second part of the competition in which prizes amounting altogether to £3,000 are being awarded by a group of manufacturers closed a week or two ago, and the entries, numbering over 15,000, were judged during the latter part of last week. At a luncheon held last Friday three of the judges, namely, Mr. Gordon Selfridge, Mr. W. L. F. Wastell and Mr. George Robey, were present to meet representatives of the manufacturing firms and of the Press. Mr. E. W. Houghton, in a short speech, said that the organisers had been exceedingly pleased with the standard of work which the entries represented, and it was evident that the competition had accomplished a great deal to extend and strengthen the popularity of photography as a pastime. The following are the chief awards which were made, in addition to numerous consolation and other prizes:—Class 1.—1st, (£100), G. L. A. Blair, Paisley; 2nd, C. Ponting, Scarborough; 3rd, Fred H. Clift, Skegness; 4th, C. Cecil Davies, Portsmouth. Class 2.—1st (£100), J. Williams, Melbourne, Australia; 2nd, E. J. Mowlam, *H.M.S. Malaya;* 3rd, Mrs. B. R. Bryant, Workington; 4th, G. E. Flack, Cricklewood. Class 3.—1st (£100), J. S. Cooper, Newcastle-on-Tyne; 2nd, Mrs. A. Jewson, Nottingham; 3rd, J. M. Purdon, Dundee; 4th, Thomas Blyth, Glasgow. Class 4.—1st (£100 and gold medal), W. Findlay, Glasgow; 2nd, George F. Prior, Chingford; 3rd, R. Caudwell, Norwich; 4th, Blanche J. W. Mercer, Dublin. Class 5.—1st (£100 and bronze medal), H. Abbott, Junr., East Dulwich, London; 2nd (silver medal), P. C. Pell, Chesham Bois; 3rd, Herbert Felton, London, W.C.1; 4th, Stephen W. Shore, Finchley, London. Class 6.—1st (£100), H. W. Burnup, Newcastle-on-Tyne; 2nd, Alfred Field, Australia; 3rd William Brown, Motherwell; 4th, James Hay, Grangemouth. Class 7 (Juniors).—1st, G. Taylor, Hammersmith, London; 2nd, Josephine Manby, Leeds; 3rd, Ebenezer Clark, Motherwell; 4th, James L. Lawler, Ireland.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

ISLINGTON PHOTOGRAPHIC SOCIETY.

To the Editors.

Gentlemen,—The effort to form a photographic society for Islington has met with distinct success. An inaugural meeting will be held at Highbury High School, Highbury Grange, Highbury Barn, N.5, on Tuesday, December 19, at 8 p.m., where excellent accommodation has been provided (by the kindness of Dr. L. F. E. Johnson). All ladies and gentlemen are heartily invited, and M. Henry Vandelmans will show (for the first time in England) specimens of the new three-colour process, and pastel colour process of Dr. Sury.—Yours faithfully,

Leonard Balston.

30, Ashley Road, Crouch Hill, N.4.

THE MANIPULATION OF MATT PLATES.

To the Editors.

Gentlemen,—Matt dry plates are now very popular; they have many advantages, and have, I believe, come to stop. During the past year I have used some hundreds of them, and shall continue to use them.

I wonder if you or your readers can suggest—or recommend from experience—a remedy for the defect known as finger-nail markings. This defect is, of course, not the fault of the plate itself, but is due to carelessness of the worker. However carefully one may work, one sometimes digs the finger-nail into the film and makes a tear. Now, a finger nail marking on a matt plate is quite different from a similar marking on an ordinary gelatine plate, because, I suppose, of the structure of the matt emulsion.

When one nailmarks an ordinary gelatine plate, attempts are usually made to get the tear in its proper position, overlapping or not, according to the skill of the worker and the method employed. In any case, the torn film usually dries quite all right, and the retoucher can put the matter right on the negative or print, and often no sign of tear is visible.

Matt plates, however, call for a different treatment, because of the film differing in some way from ordinary gelatine. When attempts are made to get a nail-torn matt film back in position it will be found not to "work" so easily as the usual gelatine coating. It is, however, useless in my hands, at any rate—to spend any time in coaxing the torn matt film back into position, for the simple reason that it will not attach itself to the glass and dry as ordinary gelatine will do. The torn piece, when dry, crumbles away, leaving a patch of bare glass, and one which is not filled up easily.

The obvious way out of the difficulty is, of course, to be careful and not nailmark matt plates, but accidents will happen, and an accident in the shape of a nailmarked matt film is far more serious than the uninitiated imagine it to be, hence my request for an infallible remedy.—Yours faithfully,

A. Beverley Thomas.

EASILY MADE ANNOUNCEMENT SLIDES.

To the Editors.

Gentlemen,—The following method for making announcement slides may be found quicker than the one recently mentioned by Mr. Reeves in your columns:—

Take an unfixed plate (preferably lantern) and write the wording with lead pencil, adding a little corner decoration if needed. Trace over this with a hot darning needle, using the blunt end. For convenience the needle may be placed in a retouching holder. Finally the plate should be fogged in strong light. Two needles may be used to save waiting, one being heated while the other is in use.—Yours faithfully,

Sydney Ashworth.

Hayhurst Street, Northwich,
December 11.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

E. M.—We are sorry that "Photopel" developers are quite unknown to us. So far as we can discover, they have not been advertised, and certainly we have never had any of this brand through our hands.

J. E. C.—We get our rubber stamps made for us by Messrs. E. M. Richford, Ltd., 8-9, Snow Hill, London, E.C.1, which is a very good firm. The Sanderson camera is made by Messrs. Houghtons, Ltd., 88-89, High Holborn, London, W.C.1.

H. A.—The lighting on the face is too hard, making the shadows very heavy. You require a reflector, or another lamp of lesser power, on the opposite side of your studio. Retouching to improve these heavy shadows is not to be recommended, the remedy being in the studio.

Roneo.—If you are contemplating entering the Process trade we have no doubt that you would be accepted as a student. You should write the Principal of the L.C.C. School of Photo-Engraving, Mr. A. J. Bull, M.Sc., at 6, Bolt Court, Fleet Street, E.C.4, and state fully your proposals.

W. S.—We have no means for analytically testing your sample of hypo, but from its appearance we should say it would be quite satisfactory. We have recently used hypo of a similar quality, appearing quite wet and of unusual crystalline structure, and found it, although we doubted its quality at first, to work quite well.

D. M.—(1) Dry mounting is now generally used, and would be most suitable for your purpose. (2) The Akron auxiliary press would suit you. This is a machine of light construction, but capable of taking your large mounts. The machine may be obtained from the Akron Manufacturing Co., 569, High Road, Tottenham, London, N.17.

A. V.—No, the lens is by another maker. It is, however, of good quality, and possesses a fair depth of focus. Lenses working at such a wide aperture as *f*/3 are certainly of use for portraits, but you must remember that the depth of focus is small, and allowance should be made for this in focussing and the arrangement of your sitter.

M. R.—Desensitising is now a practical process, and is used extensively in some of the larger studios where quantities of plates are required to be developed in the shortest possible time. Pinacryptol green is perhaps the most successful desentising agent. You could buy it from Messrs. Wallace Heaton & Co., 119, New Bond Street, London, W.

T. B.—On account of the great danger in mixing the constituent chemicals of a flash powder we will not take the responsibility of giving you a formula. From your description it is practically certain that the group was taken with one of the "Cirkut" cameras of Kodak, Ltd. A firm which undertakes the making of this kind of group is Panora, Ltd., 56, Eagle Street, London, W.C.1.

W. M. P.—You require oil-soluble aniline colours, both deep red and yellow, but we doubt if you will obtain a really good photographic ruby, as most of these types of aniline dyes pass some blue rays. The dyes may be obtained from Messrs. Stevenson & Howell, Ltd., 95a, Southwark Street, London, S.E.1. You could tint the varnish to a deep shade of orange-yellow by the addition of iodine, which may be obtained from any chemist.

M. M.—There is no preparation, as far as we know, which may be painted on electric lamp globes to render them sufficiently safe for use as dark-room illuminants. Most of the aniline colours when used in this manner pass also blue rays. A fitting which would be suitable, however, is the ruby globe and fitting, No. 64a, advertised by Messrs. Houghtons, Ltd., 88-89, High Holborn, London, W.C.1, some time ago. This is attached to the ordinary lamp holder over the electric bulb.

Flashlight.—It is best to develop your flashlight exposures in a dilute developer, say equal parts of the usual strength solution and water. This will give you a softer negative with full detail in the shadows. Your trouble is due in the first case to under-exposure. Use about twice the quantity of flash powder, and then develop your exposures as mentioned above. Yes, the "B.J." pyro-soda developer is very suitable for this class of work, but dilute it as we mention and you will get satisfactory negatives.

Enlarger.—We do not think you will be able to convert your horizontal enlarger into an upright pattern, and as you only require it for making postcards from the small films, we think it would be easier, as you suggest, to construct a printing-box enlarger for this purpose. In constructing this box you will want approximately 9 inches from the negative to the lens and 18 inches from the lens to the base board on which the postcard is placed. If the lens is in a focussing mount, you will be able to get a sharp image without much adjustment.

N. R. P.—The copyright is yours, and the making of the lantern slides is an infringement of your copyright. It is nothing to do with the publishers of the book, as you retained the copyright by the statement in your letter and their acknowledgment. It would have been better perhaps to have added the word copyright to your name under the illustrations. You should, however, get into communication with the producer of the slides and find out what he proposes to do; perhaps a payment to you would settle the matter.

Colour.—(1) The process is an old one, and we do not think the materials are obtainable now. (2) Tri-colour filters are obtainable from Messrs Ilford, Ltd., Ilford, London, E. (3) Apparently you have not allowed the bleached transparencies to remain in the dye bath long enough to absorb sufficient colour; six minutes is about the usual time (4) A book which would give you particulars of the colour processes you mention is "Practical Colour Photography," by E. J. Wall, obtainable from our publishers. Messrs. Henry Greenwood & Co., Ltd., 24, Wellington Street, Strand, London, W.C., price 13s. 3d., post free.

Brown Spots.—Your trouble appears to be due to the prints sticking together in the fixing bath It is as essential to keep the prints moving in this solution as in developing, but many workers do not give sufficient attention to this operation, especially when fairly large quantities of prints are being fixed. We should advise you to have the prints turned over and over, placing those at the bottom of the dish on top, and so reversing the position of all the prints one after the other during the whole time of fixing. An acid fixing bath should be used, and at no time should the prints be allowed to float on the surface of the solution and become partially surface dry.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3268. Vol. LXIX. FRIDAY, DECEMBER 22, 1922. Price Fourpence.

Contents.

SUMMARY.

Owing to the Christmas holidays the issue of the "British Journal" for December 29 closes for the Press to-day, December 22, as regards the editorial portion, and at the usual time on Wednesday next, December 27, as regards line advertisements.

In a leading article we endeavour to give a concrete definition of a practical kind of the kind of lighting which is described as "forty-five degrees," and proceed to show the usefulness of this example in the management of studio light, both natural and artificial. (P. 766.)

Mr. J. Effel, in the current instalment of his talks on studio portraiture, urges a livelier recognition of the artistic sense of the public, and protests against some of the time-honoured conventions which are observed in making portrait photographs. (P. 768.)

It is reported from Czecho-Slovakia that professional portrait photographers are allowed to follow their occupation only when they have been qualified by apprenticeship and by subsequent employment. (P. 765.)

The many directions in which a studio assistant can seek to become more highly qualified, are the subject of a contribution to "Assistants' Notes." (P. 772.)

In a recent lecture Professor A. P. Laurie mentioned the methods of cleaning oil-paintings, which might, perhaps, be regarded as the safest. (P. 778.)

In a contributed article Mr. W. Gard describes the running from accumulators of electric-light for the enlarging lantern. (P. 767.)

Dr. Lüppo-Cramer has devised a practicable process of making one negative from another at a single exposure by aid of a desensitising dye. The process is put forward as a demonstration of the oxidation theory of desensitising. (P. 765.)

In the current issue of the "American Annual of Photography," Mr. W. H. Zerbe describes a method of registration for multiple printing such as gum bichromate. (P. 771.)

Apropos of Mr. Tilney's review of his pictures of Westminster Abbey, Mr. Frederick H. Evans vigorously challenges the views there expressed or implied as to the essence of pictorialism. (P. 779.)

At the Royal Photographic Society, on Tuesday evening last, Mr. H. T. Meredith delivered a lecture in description of rotary photogravure as worked commercially. (P. 776.)

An exposure meter, which comes automatically into operation in accordance with the camera extension, is described in a recent patent. (P. 773.)

The Scientific and Technical Group of the Royal Photographic Society have completed the second volume of their bibliographical publication, "Photographic Abstracts." (P. 766.)

With next week's issue of the "British Journal" we hope to publish the annual index to these pages and to those of the "Colour Photography" Supplement. (P. 766.)

EX CATHEDRA.

Certificated Photographers

We hear from a correspondent that in the newly-organised Czecho-Slovakin Republic professional portrait photography is now a closed occupation, to be followed only by those whose qualifications have been officially recognised. We understand, although we have not the opportunity of confirming the information, that the qualification consists in serving a term of apprenticeship, followed by subsequent employment for a sufficient time in an approved establishment. Various suggestions have been put forward in this country in the past for applying a similar restriction, but no one, we think, has ever succeeded in devising a scheme which even approximately would deal in an equitable manner with the many grades and kinds of photography which are carried on as a livelihood. And in proportion as the processes of photography are simplified, and whilst the artistic taste of the public as a whole remains largely unformed, there is very little likelihood of the business of photographic portraiture becoming a close corporation like dentistry or even pharmaceutical chemistry. Strangely enough, it appears that in Czecho-Slovakia, or at any rate in its capital, Prague, there is an almost complete absence of co-operation between the members of this protected profession. Members of a privileged class are usually found to be drawn towards one another for the common protection of their interests, but it would seem that in this instance the sense of community is even less developed than it is among photographers in this country.

* * *

Desensitising and Duplicate Negatives.

By way of providing a practical demonstration of the correctness of his oxidation theory of desensitising, Dr. Lüppo-Cramer publishes in the current issue of "Photographische Rundschau" details of a process for making one negative from another by a single exposure upon a sensitive plate. A dry plate of fine grain, such as one coated with a lantern emulsion, is first given a general exposure to diffused artificial light for a time sufficient to yield a uniform medium density if the plate were to be developed. The plate, however, is next immersed for one and a half minutes in a solution consisting of 1 gm. of potass bromide dissolved in 100 c.c.s. of 1:5,000 solution of phenosafranine. Without subsequent washing, the plate which has been treated in this way is dried. It is then exposed under the negative for a time, averaging thirty to fifty times that which was given under similar conditions before treatment in the phenosafranine-bromide bath. It is then treated in any ordinary developer. After some practice, so it is stated, a perfect duplicate negative, though reversed as regards right and left, is obtained by this process. The chief element of success is a correct ratio of the two exposures to light.

Reproduced Negatives. The loss of quality so often noticed in reproduced negatives which have been made by contact printing for either the transparency or negative is frequently due to the fact that very little of the glass used as a support for the sensitive film is flat enough to allow of uniform contact being obtained between the surfaces, firstly, of the original negative and the transparency plate, and secondly, between the transparency and the plate which is to furnish the new negative. In the case of same-sized reproductions both these conditions may be present, but even with one there may be quite a serious loss of definition. Every experienced lantern-slide maker knows that even with a plate so small as 3¼ ins. square, the slides are much crisper if made through the lens than by contact. In making some enlarged negatives of subjects with very fine detail, we found it necessary to use a process printing frame with a ¾-in. glass front, and to apply the pressure by means of strong screws. This ensured contact, and neither negative nor plate was broken. Failing this, it is better to make both transparency and negative on film or through the camera.

* * *

The Annual Index. With next week's issue of the "British Journal" we hope to be able to include the index to the annual volume of these pages and to that of the "Colour Photography" Supplement. The compilation of these indexes is undertaken systematically, week by week, throughout the year, with the object of rendering the contents of the publications as accessible as possible to those who have occasion to make use of them. Nevertheless, we regret to find that evidently the indexes are not preserved, or at any rate not used, by many of those to whom they would be of great value. Over and over again it is our experience to receive questions which have been answered at much greater length than is individually possible in articles or notes which have been published in our pages within the preceding few months. Our publishers, also, are constantly asked to supply copies of past issues containing such and such an article, but usually without any indication of the date of the issue which is required. We endeavour to do our best for these various inquirers, but the help which we are asked to give them could be much more easily rendered were use made of the very comprehensive index which we prepare for the benefit of readers present and future. There are many, no doubt, unable to find shelf room for the bound volumes of publications such as the "British Journal," but a collection of the annual indexes occupies very little space. In our own study of other technical subjects, it is our custom to preserve such indexes of periodicals, the contents of which we may have need to consult from time to time.

* * *

Photographic Abstracts. Mention of the index to our own pages ought not to be made without a word of appreciation for the co-operative labour of the same kind which has been applied by the Scientific and Technical Group of the Royal Photographic Society to a much wider field. By examining practically all the periodicals which relate in one way or another to photography, and by making and publishing abridgments of papers and communications deserving of this treatment, Mr. B. V. Storr and his helpers have rendered a great service to the student or investigator who has need to learn of some item of fact or theory and also the place of its original publication. "Photographic Abstracts," in which this is done, has just completed its second volume, which itself is provided with a name index of many hundreds of entries, serving as a further clue to the identification of a piece of work if the name of the author is known. For the information of those who may not be familiar with "Photographic Abstracts," let it be said that it is issued quarterly by the Royal Photographic Society, 35, Russell Square, London, W.C.1, at the price of 10s. per annum, post free.

THE LIGHT AND ITS MASTER.

One of the most frequently recurring queries which we receive from our readers relates to the most desirable position for the main light of the studio, whether it be daylight or one of the many forms of artificial illuminants. Many of the inquiries which refer to artificial lighting come from photographers who have been working with daylight for years, and yet have not grasped the elementary principles of lighting to an extent which is sufficient to enable them to deal with an unfamiliar source of light.

The first point which has to be grasped by the beginner is, that within certain limits, one kind of light does not vary greatly from another, the difference between them being more in the way of intensity or strength and in concentration, rather than in an essential quality. There is no reason why any difference should be detected between a picture taken by daylight and one taken by any artificial light, even flash powder, provided that the light is skilfully controlled and a correct exposure given.

It has been accepted by practically all authorities on the subject of lighting the figure either for photography or painting, that the best starting point for the student is to commence with a light falling upon the head of the sitter at an angle of forty-five degrees. The light might, however, fall at this angle from many directions and would give as many different effects, so that it is necessary to explain in which way it should fall to produce a simple "three-quarter" light.

Given an ordinary rectangular apartment with top light or with a very high side light, the sitter is placed in front of the end wall, the whole of the glass being covered with blinds or curtains. A long rod, such as a billiard cue, has one end placed upon the sitter's forehead just over one eye, and then swung round so that it is at an angle of 45 degs. with the floor and also with the end wall of the studio. The free end of the rod will then be pointing towards the place at which light should be admitted to give the maximum of roundness in the picture. This gives the dominant light, which may be modified to obtain any desired effect, or to suit the physical peculiarities of the individual sitter.

Starting with an aperture, say, three feet square, it will probably be found that the lighting is fairly satisfactory but rather too vigorous for most tastes. It is therefore permissible to broaden it so as to give softer shadows, or to admit a lower side light to illuminate deep set eyes or to reduce the shadows in hollow cheeks. An old axiom of unknown authorship sums up the art of lighting in a few words. "Light from the sitter's end of the studio gives contrast (or brilliancy); light from the camera end gives softness." If this simple rule be borne in mind when in doubt as to arranging the blinds, the difficulty will at once vanish. If the blinds cannot be conveniently placed, the same effect can be produced by seating the model more or less under the darkened part of the roof.

As has already been remarked, such variations are necessitated by the differences between one sitter and another, but as a general principle the use of the 45-deg. light should be mastered, and other lightings will follow

almost automatically. It is important that the operator should feel that he is absolutely the master of his light, and this can only be done by starting with a small dominant light and broadening as necessary. The plan often seen of starting with a flood of lighting and shutting out what is deemed necessary, is a bad one for the beginner, for, as a rule, he will not shut out half enough.

With the knowledge thus gained the transition to artificial lighting presents no difficulties. The billiard cue will still serve to indicate the position of the dominant light, and the rest is a matter of diffusion and reflection. When a satisfactory negative has been obtained, the face being turned slightly away from the light, the operator should walk round his sitter to see how many different effects can be obtained without moving either light or sitter, the camera being moved into the proper position for each. The next step is to move the sitter so that stronger effects, "edge" lighting or Rembrandts, can be obtained. When the flash is the only possible light, the correct position for it can be found with the help of an assistant holding a lamp, which should be moved until the desired effect is obtained. A reflector will, of course, be necessary, and this also may be located by the aid of the lamp.

Points to be remembered in artificial lighting are: the nearer the light is to the sitter the harder the lighting and the shorter the exposure; a single concentrated light requires more diffusion, and consequently more exposure, than the same candle power made up by several lamps placed a little distance apart; reflectors should be placed where they will receive light; half-watt lamps do not retain their full efficiency right up to the time that the filament gives way; no direct light from the lamp or lamps is allowed to reach the lens, an efficient hood or curtain being necessary; and finally, the most rapid plates should be used.

Results, indistinguishable from each other, may be obtained with open or closed arcs, half-watts, incandescent gas, acetylene or even flash light, the only differences being those of length of exposure and convenience in working, so that the owner of any of these installations need not despair of success.

ACCUMULATOR LIGHTING FOR THE ENLARGING LANTERN.

The apparatus available for enlarging by artificial light has now reached a stage closely bordering upon perfection, but the actual illumination of such apparatus seems to have been somewhat neglected. After exhaustive tests of all the suggested systems, I have decided that electricity is the most reliable and effective. But the difficulty in this direction is that the power for such a light is not available to all workers, and consequently these have to use an illuminant often quite unsuitable. Another disadvantage which has deferred the use of electricity is undoubtedly the unsuitability of the ordinary lamp, the filament being too prominent and needing careful adjustment to prevent its design showing in the resulting print.

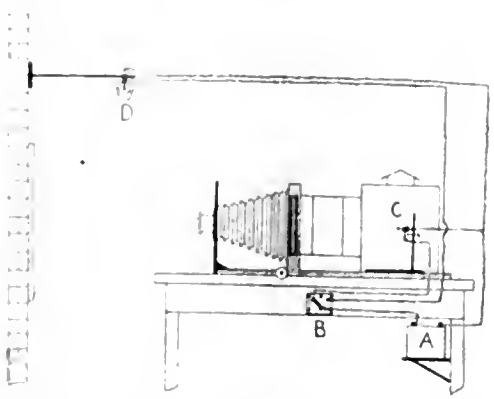
It is, of course, well known that the source of light in all apparatus of this kind should approximate as closely as possible to the smallest area of incandescence, a point of light being of greatest service and giving most even illumination. The electric arc answers these requirements, but this light is expensive to install and difficult to regulate, while it is limited to workers who have available an electricity supply. The Edison "Pointolite" lamp is also an excellent illuminant for the lantern, but this, again, requires great care in working. However, to those who use electricity the lamp may be recommended with every confidence.

It is, however, to those who have no electric supply that these notes are directed, the system suggested being both simple in use and easy and cheap to maintain.

The 4- or 6-volt metal filament lamp used in the head lamps of motor cars provides an excellent source of light; coming from what is practically a point, and of great brilliancy. The bulbs being perfectly round and "pipless," offer no obstruction to the light, while the lamps themselves are easily fitted in the lantern. The lamp may be run from an accumulator which is placed in some out-of-the-way position, and the dark-room may also be illuminated from the same supply.

For 4-in. to 5-in. condensers a 4-volt 4-watt lamp should be obtained, and also a 6-volt 60-ampere-hour accumulator. For 6-in. to 8-in. condensers a 6-volt 12-watt lamp is necessary, and the accumulator should be 8-volts 40-ampere-hours. For connecting up the lamp it is necessary to obtain first about 6 yards of thin electric light flexible wire or cord, as it is called of the size 35/40. Bell flexible wire, although thinner and cheaper, is not to be recommended, as the insulation is not so good as that used in the true lighting flexible.

My enlarger is arranged exactly as in the drawing; the easel is against the wall, and the apparatus itself stands upon a table. Over the easel and suspended from a bracket fixed to the wall is an 8-volt lamp D covered with orange paper. This allows plenty of light for fixing the bromide paper in position, and I find it much easier to use this light than to place a yellow cap on the lens. In the enlarger is a 6-volt 12-watt



lamp C fitted to a holder, which allows the light to be focussed and raised up or down. If the lamps are fitted with the bayonet cap system they may be attached to similar holders, but if screw caps are used it will be necessary to solder the leading wires to each pole of the lamp. For instance, the screw itself should have one wire soldered to it, and the metal tip to the other.

The slide holding the lamp is fitted to the rod of the lamp tray by means of the usual screw fitting, which in my case is a portion of a reflector originally intended for use with gas. A two-way switch is needed to allow either lamp to be switched on separately. It is not necessary for both lamps to be alight together, and a switch preventing this waste of current is quite necessary. The switch B is fitted to the side of the

table, and is quite out of the way. The connections to lamps and switch are shown in the diagram by the wavy lines, but the wires are shown as single ones. The cord used is of course double, but it will be easy to follow out the method of wiring and to cut the cord where necessary to make the connections.

It will be noticed that the lamp in the lantern is 6 volts, while the accumulator supplies 8 volts. Such a lamp being run on a heavier current will give an intensely bright light, but its life will consequently be shortened. As the light is only actually in use while the exposure is being made, it is found in practice that the lamp does not suffer to any great degree. The exposure with clean, fairly thin negatives, when enlarging to 10 × 8 or 12 × 10 from half-plate, is only a matter of a few seconds; usually I find 4 seconds quite sufficient.

The accumulator A, it will be noticed, is placed upon a shelf under the table, and in this position is quite out of the way, yet easily removed when it requires re-charging. It is strongly advised, when purchasing this part of the equipment, that only the best and most reliable make be obtained. Second-hand accumulators are to be avoided unless one is sure that they have not been damaged in any way by the previous owner. This is a point difficult to decide, and my advice is to leave them alone and buy a new one of well-known make.

The first charge should, if possible, be put in by the makers, but if this is impossible it should be handed over to a good firm of electricians, who make a specialty of accumulator charging. The first charge is of greatest importance to the life of the accumulator, and should be done with great care. When the accumulator is in use care should also be taken that it does not run down too far. If the light begins to appear dim, a new charge should immediately be put in. Most garages now charge accumulators for a few pence.

W. Gard.

WITH A PORTRAITIST IN THE STUDIO.

[In continuing his chapters on the essential things in photographic studio portraiture, Mr. J. Effel passes to consider some matters which he groups together as those of "criticism, character and convention." In doing so he takes exception to some of the rules which have often been taken as gospel, among them the dictum that the side of a sitter's face which should be photographed is the one which does not disclose irregularities or defects of feature.]

XI.—CRITICISM, CHARACTER AND CONVENTION.

Anyone who has acquaintance with stereoscopic photography will appreciate that portraiture by one lens tends to broaden the features; after all, we have to recognise that when we put upon paper a representation of a rounded object, we are actually reducing everything to the one plane. With sculpture there is no question of lighting, but the great problem for the photographer is to get the work to "stand out" sufficiently to convey the full story of the face. I maintain that the "too near the camera" objection is a sound one, based on the inability of the one-eyed camera to see round the sitter, and to give steep planes faithful rendering.

Generally speaking, it is in bust portraiture that this objection is so often met with. I would say, most decidedly, that with the average everyday work large heads are unpopular. Roughly speaking, well-educated persons may be taken "near the camera," with a greater chance of success than if our clients are lacking in culture, but the big head and figure are not popular. I find that I have quite got into the habit of sizing my portraits to indicate the height or build of the sitter, and in many cases to suggest the proportions wished for. Take a stout man who wants a three-quarter length. If you cut him off by the knees without any vignetting, he will most decidedly be "too near the camera." After reducing his avoirdupois by skilful posing and lighting, a figure slightly on the small size should be made with the help of intelligent vignetting. Women, and particularly stout women, dislike big figures, and it is worth notice that portraits of babies are frequently adversely criticised for being too big. Altogether the "too near the camera" is a fault which requires to be carefully thought about.

It is likely that if photography in natural colours suddenly took the place of our accustomed work, retouching would be largely a thing of the past, and it might also be true to say that there would be fewer problems in lighting. The camerists of a past generation, in the endeavour to put brightness and "colour" into their work, achieved only contrast and hardness as a rule. The later school—helped very greatly by the wonderful advances in the manufacture of photographic material—worked for "softness" and half-tones and fine detail. The ultra-modern portraitist now adds a little of the old school into the general working formula of the new by the addition of "pep" where wanted, by what is now well known as "spot light."

The Victorian photographer (I am referring to period, not to size of picture) favoured "plucky" results, and considered good contrast the popular taste; his successor (very frequently because his work was over-lighted and over-exposed) eschewed hardness, and thought the public should be educated up to *his* standard. Both were wrong, and the real fact of the matter is that little or no attempt was ever made to find out what class of picture would make the widest appeal, or to find the reason or reasons why photographers were suffering from lack of patronage.

The poor public have been sadly maligned. When I see the rubbish in art, in literature, in civic ideals, in philosophy, in education and culture, to say nothing of bad housing, rotten furniture, and adulterated food of a "popular" nature, I get something of a pain. As one who has been before the public in different *rôles*, I am firmly convinced of this fact that good work in any calling is the surest road to success. Yes, but that is just the problem for us, for what *is* good portrait photography? Emerson tells us that a man who makes better mouse traps than his fellows will soon do all the trade, but generalisations about portraiture are not so easy. It is soon settled if a mouse trap is a good one, but the same test cannot be applied to photographs, although I have heard that some pictures were fit to scare rats. There is unanimity of opinion that the trap which catches the most mice is the best, and there is never any preference for soft focus effects over sharp contact work. We are not such favoured individuals, however, as the mouse trap manufacturers, for it can truly be said of portrait photography that

> "Ten men love what I hate,
> Shun what I follow, slight what I receive,
> *Who shall arbitrate?*"

Surely, then, it is a matter of some difficulty to answer the question, "What is the popular taste in photographs?" Of course it is, but the difficulties are not insuperable, and, as usual with my somewhat original reasoning, we will best tackle the problem by first thinking of something else.

Let us give a few moments' consideration to what we call

"the public." An actor will tell us that the public won't take certain work; the comedian will assure us that his new song will bring the house down, and the practised orator will know the rhetorical tricks which get him *en rapport* with his audience, but I have no wish to let my readers into an Emersonian mouse trap, for in the cases I have mentioned the "public" must be regarded as a crowd or group, expressing a feeling common to them all at the psychological moment of appeal. We have also to remember that the politician, the actor or the lecturer moves within a very circumscribed area and draws to himself just that class who want exactly what he has to offer. The photographer, on the other hand, makes a purely personal appeal to individual taste or idiosyncracy, and where the stage artist gets his effect "across the footlights" in a second, the camerist's work is taken home, critically regarded, and judgment passed on it by quite a number of individuals or, as we might reasonably say, different people.

Fortunately, however, "most people are other people," and their artistic tastes may be gauged fairly accurately by considerations of class, of breeding, or of education. If I were working tin-types in Epping Forest *f*/32 would be my standard, while for Edinburgh highbrows, judicious fuzziness, or good, honest moves might be the right "atmosphere" in Auld Reekie.

But, after all, there are common denominators. Deep down in the heart of man is a love of colour and brightness. Let him be cursed with a bad liver or a spurious refinement, and he will shudder at the crudities of colour, visualising the world and its inhabitants in neutral tints, but Tolstoi's "unspoiled peasant" is a better judge of art values than most individuals who are credited with the possession of "culture." The child with his fondness for crimson lake and emerald green is wiser than we, and the pure colour of life is sicklied o'er with the Payne's grey of age. Most of us feel that we are doing wrong, for we all profess to love the sun while we burrow ourselves into cellar studios, drawing blinds across the face of God and blaspheming Nature with the feeblenesses of electricity. We talk about hygiene and fresh air, but all we mean is a draught in the dark-room where some poor ghoul spends his life. We play about and experiment with light, but most of our life is spent in shadow. We lead grey lives, we think grey thoughts and our very souls are grey. Something of this truth must have been perceived by the old albumen worker, for he "sunned down" or "tinted" his prints before toning, to soften his garish effects, and the "half-tone" artist must have felt that something was lacking, for, while shadow is the supremest thing in life, even the dreariest sitter turns sometime to the sun. And, Eureka! we have found that *spot light is an oasis in the Sahara of shadow.*

Having delivered myself of this purple passage, I will now put in a small stop and focus things a bit finer. What delights most the heart of a poor pioneer who has spent years in the wilderness putting both feet through backgrounds, skylights, systems and axioms is that the acceptance of "spot light" means the complete overthrow of the stultifying effects of dead-hand dictatorship.

In the main, poor or uneducated people like broad effects, vivid colouring and portraits that flatter. Ascending the scale of intelligence we will find a perception that if a thing is not white it need not necessarily be black, and a recognition that if Nature did not endow with beauty and regularity of feature, a faithful portraitist must tell the truth. Notwithstanding these points, and the fact that sitters frequently admire styles *for others* which they would not accept for themselves, I would say that a bright, clear photograph with the face well illuminated and in perfect focus, if anything a trifle "hard," and preferably looking to the front, considerably flattered in the retouching, and with the happiest expression that can be coaxed—that's a good enough working formula for everyday work. If to this technical quality you add a little of artistic feeling, cut out all the old stunts in backgrounds and posing (and vary the styles frequently) and hand to your client a finished print something different in tone, in texture or mount from the "usual thing" they have become tired of, all other things being equal, you ought not to lack customers. Beware of over-lighting and over-exposure. The dull, grey, unimaginative public need to be sparkled up a bit. A white dress may not look like a clean sheet of paper, but that is preferable to looking like a dull grey garment.

I am quite aware that in the foregoing paragraph I have said nothing that will make for a decided advance in what may be called real character portraiture. I sometimes think when photographic Jeremiahs lament the low standard of work in so many studios, and wish to "elevate" the humble fraternity (who, as a rule, do not want to be "teached") that they go the wrong way about improving our status. After all, everything is relative. Given a thousand literary men who could turn out epigrams and paradoxes from morning till night, then Max Beerbohm, Gilbert Chesterton and Bernard Shaw would be looking for the unemployment dole. Let all the dud portrait workers suddenly become artists, psychologists, students of efficiency, masters of book-keeping and card index systems, every man jack of us keen to smell out a business proposition, quick to run after it, and competent to carry it through—then, well then, I'll tell you what would happen, *the game would be up a gum tree.*

I try very hard to be intellectually honest. If there had not been a big army of rotten retouchers in my youth, I could not have shifted from city to city, from country to country, never lacking employment, and now I am grateful to my inefficient competitors, for their lack of ability keeps me living. Let us realise very fairly and squarely that we know what we are talking about when we glibly speak of the standard of professional portraiture, and shed tears over the retouching and pathetic wail that only 3 per cent. of the community spend money on photographs. I think if I were interested in getting the motor industry to advertise with me, I could make out a good case that less than 3 per cent. of the public spent money on automobiles! Add 50 per cent. to the capabilities of every photographer in Great Britain, and, *relatively we would be exactly as we are at present.* And at the same time do not let us talk too much of educating the public taste. Given a 100 per cent. increase in the artistic perceptions of our clients, despite our 50 per cent. improvement, we would be worse off than ever, for the extreme art lovers would have no photographers clever enough to satisfy their fastidious tastes, and at the lower end of the scale the poor worker (already gingered up 50 per cent., mark you) would find himself, like Othello, his occupation gone. Figures are funny things and can be made to prove anything. I could turn this 3 per cent. upside down, reduce and intensify it, split it up into decimals and vulgar fractions, square it and make rings round it, for, as we all know, there are three kinds of lies—common or garden lies, damned lies and then statistics.

When is the right side of a sitter the wrong side, and are we right in taking the right side which happens not to be the right side, or would it not be right to take the wrong side which happens to be the right side? That was Mr. Swan Watson's conundrum at the recent conference, and it certainly is well worth discussion, so also is the ex-president's opinion that the habitual expression was of more value than the fleeting.

I think we have exaggerated somewhat the idea of the left side invariably showing more beauty than the other, but admittedly it is seldom that both sides are equally good. The point of discussion is: Are we mistaken in photo-

graphing that side of a client's head which shows the features at their best, and avoiding or minimising irregularities, and would not better likenesses be secured by taking what we formerly termed the *wrong* side, concentrating on, rather than avoiding "points" which may not be beautiful, but which are individual and characteristic? And a supplementary question must be asked—is character portraiture of that nature likely to prove acceptable with the public?

Lord Nelson, so I am told, had only one eye, and I quite believe he would not have been offended with the work of an artist who made a point of that, but he would have been very angry with the painter who offered him a miniature of Lady Hamilton making a special study of a buckled ear. I know full well that, as Mr. Solomon J. Solomon says, character is a breakaway from the normal, but sad experience has proved to me that individualism, the most beautiful thing in life, is appreciated by a very small section indeed. I fancy the "wrong side" portaiture, if adopted by Mr. Swan Watson, would result in a masterpiece of his having the head cut off and deposited in the safe of an Edinburgh merchant prince. A few cranks here and there (generally poor fellows, brother artists as a rule) will take real character portraits, but the great majority want flattery, *and need it.*

Of course we all know the "just as I am," Cromwell-and-his-warts individual, and we have to humour him accordingly. When we are asked for the candid truth, it pays better to give what is really wanted, the *candied untruth.* When I had the misfortune to live in Scotland I was once honoured by a commission to photograph the MacTartan of Haggisvale. He had enough character in his face to "gar the salmon loup" (as I heard an apprentice say in what I understand is "braid Scots"), and he told me that no one had ever taken him to his satisfaction, and that he wanted *no retouching.* I always know I am up against something when I hear that a client has never yet had a good photograph. I started with a prejudice in this case, and with scarcely any hope. No selection was possible, for the only way to find the less bad side was the method of the Irish jarvey with the hotels—whichever you chose you'd wish you had picked the other. The noble chieftain arrived when the light was at its worst, and was taken without the support of head-rest. Only one negative—a 12 by 10 head was steady. Oh, face of Peterhead granite, what a dial was there, my countrymen! Panchromatics, light-filters and suchlike aids to the better rendering of colour were then unknown. Unfortunately, I had got the negative sharp, it was under-exposed and raw, and ten thousand freckles leered up at me unashamed in all their clear glass nakedness. "No retouching" on this result did not look like a winner. I consulted Briggs, the cockney retoucher. "Fat oil and plat" was his solution, which sounds cryptic, so I will explain. We printed in P.O.P. and platinotype then, and a much finer touch was required for the gelatine paper. As stronger negatives were made for "plat," fat oil of turpentine was frequently used as medium, and a coarser stipple employed. So I fat-oiled, got my No. 2 Hardtmuth sufficiently blunted, focussed the sighting distance in the accepted way by extending the fingers of both hands, tandem fashion, from nose to negative, and then proceeded to "give it plat." I slogged at it for hours, then Briggs had a go. We cross-hatched, stippled, drew figure eights, inverted commas and barbed-wire entanglements all over the face. We wound up by matt-varnishing, stumping and thumbing gamboge on the reverse side. The print was made and mounted, a splendid example of the no-retouching school, and "smallpox or leprosy?" would have been an appropriate title. I was dead scared at the prospect of the MacTartan's wrath, but, to my great relief, he hailed the result with delighted hoochs of joy, danced a pibroch and tossed a caber in the reception-room. "A wud ha'e nae scartin' at ma face," he said with great dignity, as he invited me to partake of cock-a-leekie and whuskey.

To this day I verily believe, in the clachan of Haggisvale (by the way, what is a "clachan"?) hangs that immortal work of realism, the unretouched portrait of the mighty chieftain in whose waters you would not dare to shoot grouse.

After all, what *is* the real man, and, as Browning puts it, who is to arbitrate? Most of us spend our lives in very paltry concerns, and our faces bear traces of the thousand and one little worries which ought not to have bothered us a bit. Indigestion may be mistaken for intellect, and a soft focus portait of a myopic youth (black hair sharp and carefully spot-lighted) with blackleaded face, and fist clenched to his jaw may *mean* "character," yet convey instead the impression of neuralgia. When we see craftiness, meanness, bigotry and other unsocial qualities stamped all over a face, is it good business to feature them, or would it not be better to work for a fleeting glimpse of something different? In my opinion there can be but one answer. Then, what is the habitual and what the fleeting, and once again, who is to arbitrate? Mr. Swan Watson would be proud to have ancestors whose characteristic expression was that of scaring less fortunate fellow-men off God's earth. It is entirely a point of view. "Yon birkie ca'd a lord" better expresses my attitude to the man for whose ghillies I have the profoundest contempt. Don't think the recent elections have unhinged me. I am not talking politics, but character study, and am laying stress on the fact that different men see different things in the same subject, and a "character study" is frequently a reflection of the artist rather than one of the subject. Then again, a man is not one man, but many men, at different times. What is a characteristic portrait of Lloyd George. Would not it be true to say that there are scores? And yet, which one is the favourite one of Mrs. Lloyd George? I venture the opinion it would be a smiling one.

The other day I was reading the reminiscences of a great man by his widow. One thing struck me forcibly, and that was that the writer had far more loving memories of the little silly jokes of her husband than of his many public triumphs. That, I should say, is a common feeling. We see the austere judge with dignified mien, but a different man is seen by the little son chasing his daddy at play in the garden. Let us tell the public that every man is a dozen men, that is to say, requiring a dozen different positions, and that will be all to the good. But if we are one-plate artists, look for the better side, forget about Nelson when you have a boss-eyed client, think of cheerfulness, and be ready to snap the fleeting smile, and the box-office will know there is something doing.

J. Effel.

The Salex Review, issued by the City Sale and Exchange, 81, Aldersgate Street, London, E.C.1, contains in its current issue some notes on spot lighting, co-operative advertising, soft-focus lenses, in addition to lists of numerous bargains in cameras and other apparatus for professional photographers. The "Review," which appears monthly, will be sent regularly to any bona fide professional photographer on application.

Imperial Plates, Film and Paper.—We have to thank the Imperial Dry Plate and Film Co. for sending us one of their calendars for 1923, bearing their well-known trade mark of a lion rampant and usefully calling attention to the well-known leading products of the firm. We believe the calendar is obtainable by professional photographers and photographic dealers making application to the company at Cricklewood, London, N.W.2.

A METHOD OF REGISTRATION FOR MULTIPLE PRINTING.

[To those enthusiasts who still work the multiple gum process of printing, some method of exact registration is of great importance. In the following paper, from the current issue of the "American Annual of Photography," the writer suggests the use of a glass plate to which slips of glass are cemented, to form in part two sides of a square. To supplement these, strips of gummed paper are placed on each of the four sides of the registration mask, and lines drawn which are made to coincide with others placed upon the printing paper. The suggestion as to the use of good paper for printing is an excellent one, as however careful one is to make the correct provision for future registration, it will be found impossible to prevent overlapping if the paper has swollen or stretched unequally during the process of development.]

So much has been written by capable writers in the photographic magazines about gum printing that I hesitate to offer anything on the subject. However, taking a chance that my method for perfect registration for multiple gum printing is new, I will endeavour to explain it, hoping some of the newer gum workers will gain some points by reading it.

Fig. 1 is a piece of plain glass somewhat larger than the size of the negative to be printed from. On this glass two narrow

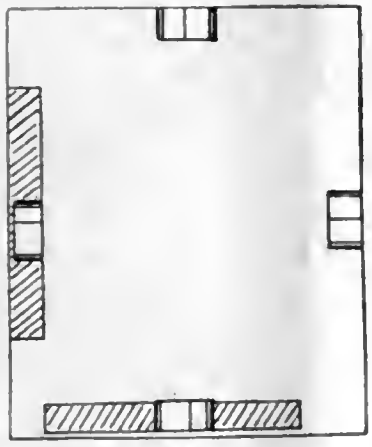


Fig. 1.

strips of glass are cemented to form the angle of a true square, leaving an opening at the corner which keeps grit and dirt from collecting. These strips can be cut from an old cleaned negative. The cement I use is called Spittler's cement, bought in a Woolworth store. Paper or wood strips could be used, but there is a chance

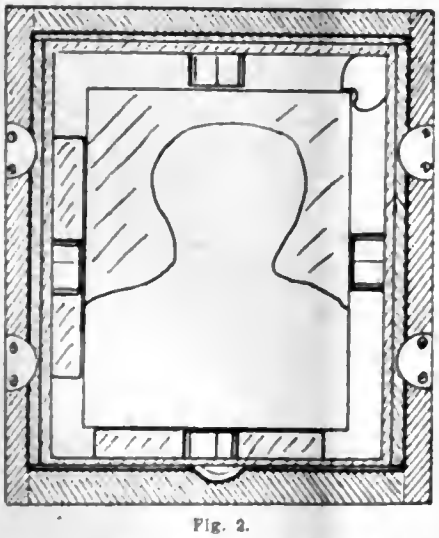


Fig. 2.

of atmospheric conditions swelling or shrinking them, and this must be avoided if perfect registration is desired.

On the sides, top, and bottom paste a piece of gummed paper where the centre of the negative will come. Now draw a line across in the exact centre from side to side, and top to bottom. These marks are shown in fig. 1. Fig. 2 shows a negative in place in the printing frame, which, of course, is larger than the negative used to print from. Care must be taken to hold the negative snug against the glass sides. For this purpose I use a small spring shown in the upper right corner in fig. 2.

The paper to be coated should be of a good quality and one that does not stretch much. Either before or after it is coated the back of it is marked off with a T-square, making a line about three-quarters of an inch at the edges in the centre of sides, top, and bottom. For this purpose I use a drawing-board which has a line drawn across the centre from top to bottom and side to side. The paper should be about an inch larger than the negative, which allows a half-inch margin to facilitate future coatings. It is tacked to the centre of the board face down, and the registration marks are made with the T-square. In this way the marks are perfectly square, even though the paper may not be. Besides the registration marks it is advisable to make some distinguishing mark, so that the image from the first printing will match the negative at future printings. Occasionally the subsequent coating

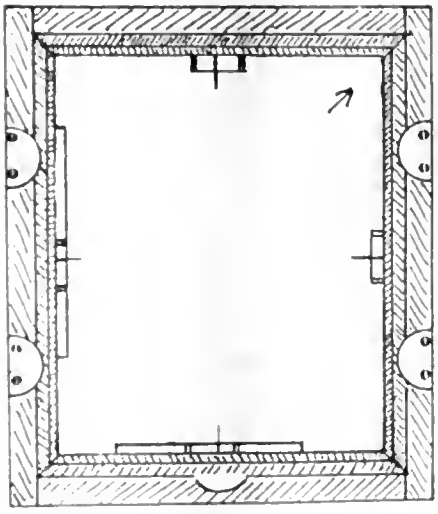


Fig. 3.

may cover the first so that the image cannot be seen. I make an arrow in the top right corner.

Fig 3 shows the printing frame with the negative in place, a piece of coated paper face down and the registration marks made to match the marks on the glass with the guide strips and gummed paper registration marks. The piece of paper shown is the exact size of the printing frame, and sections have been cut out at the registration points. The arrow shown in the drawing is thus supposed to be on the back of the paper. These must all be kept in place until the back of the printing frame is placed in position, when it is ready for printing.

After the print is developed, dried, and re-coated, all that is necessary for registering is to lay the paper so that the arrow is in the top right corner, and the registration marks again match each other. This can be done repeatedly for as many printings as one wishes to make.

If there should be any stretching of the paper, it will be from the centre, and will be distributed four different ways, and not noticeable. In the usual method of registering the negative and paper from the corner of the printing frame, the stretch will be from one point in the corner to the opposite corner, and if large sizes are used there will be quite a noticeable overlapping of the image in the other printings.

B

Be sure to select a good quality of paper, fairly heavy, and one that does not stretch. A good test is to cut a strip of the paper that it is desired to use, say about 12 inches long and 2 inches wide, so that the ends are square. Cut this in half, so that you have two strips 1 inch wide. Now soak one of these strips in water for about an hour, and then dry. Then compare the length of the two. The one that was soaked will be longer if the paper is unsuitable.

For multiple printing use a minimum amount of pigment, and coat very thin. My own method is to print very strong with a thin coating of pigment, so as to get a good impression of the high-lights. When these and the half-tones are satisfactory, I give a heavier coating—that is, more pigment—giving a shorter exposure so that there will remain nothing but shadows from this printing, the high-lights having washed away.

WILLIAM H. ZERBE.

Assistants' Notes.

Notes by and for assistants will be considered for this column. Payment for accepted contributions is made on the first of the month following publication.

Assistants and their Training.

FROM time to time letters and remarks appear in these columns with regard to the difficulty of getting really well-trained and thoroughly-competent assistants. All regret the fact, but few, if any, I think, point out any remedy. But surely a remedy would be better than the regrets.

It is strange, if one stops to think of it, what a difference there is in the preliminary training of, say, doctors, schoolmasters and the would-be assistant in an exacting business such as photography; for I am sure that all those who know it best will at once grant that photography *is* an exacting business.

The doctor-to-be and the prospective schoolmaster both serve a long pupilage to their professions, study for years along well-defined lines, but the course of the pupil in photography is much more haphazard. He (or she) usually serves an apprenticeship of two or more years, putting in more or less time in each department, and then is turned off to pick up the rest for himself as best he can. In the case of girls this method is perhaps less harmful than in the case of youths, especially those with ambition and the desire ultimately to own a business of their own; and it is no use to smile at the serious lad who says he means to have a business of his own one day, for he generally ends in doing it.

I think, perhaps, one of the most useful things the P.P.A. could do would be to frame a course of study such as could be followed out by girls and youths, for the combined wisdom and experience of the council members ought surely to frame nearly an ideal course. Meanwhile, I would like to offer a few suggestions from my own experience.

First the pupil should be impressed with the fact that there is certain useful knowledge which he or she cannot hope to obtain in business hours, but which, if they are ambitious enough to desire it, must be sought outside, in technical classes and by private study. But it is a knowledge which amply repays both lads or girls for their trouble.

First, there is the real necessity for both to reinforce their technical knowledge by a practical training in Art, freehand, black-and-white and colour work, for such practical knowledge ultimately raises the whole tone of their work, renders it more valuable, and saves the photographer from many pitfalls to which he is liable without it. The study of black-and-white work is especially useful, as it conveys a knowledge of tones and tone values which are of the greatest use both in outdoor and indoor operating, and also in working up and judging the use of colour screens.

Girls, again, may with advantage give extra time and attention to colour work, which it will later on often pay them to specialise in, for it is of great added value to a receptionist or finisher to be able to colour well and intelligently, not merely tinting, but working, if necessary, from a freehand basis.

To a lad, again, a term or two devoted to elementary chemistry is often of much service later on, enabling him to grapple more intelligently with the troubles that may arise in the course of his dark room work, or in the evolving of new methods or formulæ, in the understanding use of his working materials, the necessity of cleanliness, and proper working conditions.

This is all on the technical side, but to the pupil who is keen to launch out for himself there is other knowledge, the possession of which is of the utmost importance.

All owners of businesses need a sound working knowledge of ordinary bookkeeping, and its possession would have kept many a good worker out of the bankruptcy court. It is most essential to be able to keep a proper check upon all materials used, out-of-pocket and running expenses, and to be able to cost up the production of any quantity of work so that proper quotations may be given and work may not be done at a loss, as it has been in many cases, owing to ignorance of the actual cost of turning it out. Also, in case of disputes with income-tax officials, the production of properly kept books on the usual system, will greatly simplify matters, and avoid much heart-burning and bitterness; while, should the owner wish to sell his business, there is no better credential than the production of well-kept and easily-understood books.

It is the rule with all large concerns always to put aside a certain percentage of their takings—not profits—to a reserve fund, to meet any unexpected emergency that may arise, and a very wise rule, too; but I am afraid not one photographer in twenty carries out this rule, with the result that when some heavy charge arises for structural alterations, new apparatus or other trouble, he either has to borrow capital, or draws heavily upon his profits. This is not a wise or businesslike way, and only leads to much worry and anxiety; but if the young photographer started off along the ordinary business lines, rigidly putting aside this reserve and leaving it untouched, many would be enabled to carry on instead of coming to grief.

Also, the prompt, accurate businesslike sending out of accounts results in quicker payment from customers, and easier payment of wholesalers' accounts by the photographer, with resulting saving in discounts, and better feeling between maker and user of materials.

There are many quite ordinary business rules and methods of which many young photographers seem quite ignorant, with the result that they are landed in many needless troubles. Adequate insurance of premises and stock, proper insurance of casual help under the Employers' Liability Acts, proper conformity with any local by-laws as to days and hours of closing, and proper stamping of insurance cards, all call for the necessary knowledge; as also the local rules respecting buildings, space of open backyards, and so on, in large towns, and also such things as the laws of ancient lights, where a photographer contemplates building a studio. It is infinitely easier—and cheaper—to settle these matters amicably with your neighbours beforehand than to go to law after, and to study the laws of leases and tenants' rights beforehand than after the lease or agreement has been signed. All matters as to repairs, out and inside, should be made quite clear, and also the ownership and valuation of the studio itself, or any other workrooms the young photographer may erect. These look small at the beginning of, say, a 21 years lease, but let the photographer expend perhaps two or three hundred pounds, and as the end of the lease draws near, it becomes a very large matter.

Another very useful study, for either the lad or girl assistant, is lettering, for often the ability to write neatly and quickly titles under prints, names, dates or announcements for the window, with a clear style that has nothing "home made" in its look, is most valuable, especially in the higher class studios. It is not a lengthy study, but certainly most useful.

Another section of knowledge which is often of benefit is that related to printing and process reproduction, the ordering and making of blocks, their correct use and variety. Often photographers are called upon to supply prints intended for reproduction and block making, and a little correct knowledge of the process would enable them to supply much more suitable prints, thus entailing a considerable saving to the customer in after-work upon the print by block makers.

It is always useful for the young and enterprising operator who is launching out on his own account, or is taking up the management of a branch studio, to mix as much as possible with other business men, of no matter what kind of business, and keep his ears well opened, for in this way he will gain many a valuable hint from the old-stagers. Modern business is a complex thing, and if he proposes to run an amateur department, he will be in just the same position as any other dealer, who buys and sells to make a profit. Any mechanical knowledge, too, of whatever kind he can pick up will never come amiss, for there are a hundred

and one small jobs which crop up in any studio from time to time. Also to most photographers, a sound working knowledge of framing and mount cutting is necessary, as most photographers do more or less of this kind of work, and it all goes to swell the annual profits.

The case of the girl assistant is somewhat different, as she less often has any desire to own a business, and looks upon it more as a career to last her until her marriage than as a life work. Still, she hopes to make as good a living out of it as possible up to that time, and to that end needs a good deal more knowledge than her apprenticeship usually furnishes her with. If her work lies in the reception room, she, too, will need a thorough knowledge of modern bookkeeping, the preparing of balance-sheets, and so on, and the checking and control of amateur stock and cameras. Also, some knowledge of the framer's business, and any other side line, such as prints or pictures which the photographer may run, *e.g.*, lockets and pendants, and so forth. Also, in most studios of the better class, a typewriter is now used for correspondence, and also card systems and other modern office appliances for time-saving. She, too, will need an art training, and some knowledge of the modern art of salesmanship will be of use to her. The cultivation, too, of keen powers of observation, and memory, is a very great asset, while in some studios the ability to speak and write correctly in French and German is most valuable; at any rate, she needs to study the whole art of a saleswoman and correspondent.

There is, too, another class of woman assistant, less seen but no less important, and that is all those who are in any way connected with the finishing of negatives and prints. To them the knowledge of drawing and black-and-white work is of the first importance, outside the mere correct technique of their work, such as the use of air brush, dry-mounter, etc. Much of this knowledge, of course, they will have to seek outside the studio, where all is bustle and work, with no time to teach juniors who do not know, but I can assure them it is well worth the expenditure of spare time and money to attend art classes.

Of late years many women have become first-class operators, and they, too, need a sound art school training, and a good knowledge of the technical side of dark-room and printing methods, to which end membership of a good photographic society and regular study of the various photographic journals are very helpful.

It all comes to this: You cannot expect something for nothing in the labour market, and if you don't put in years of expensive college training you must at least be prepared to put in a reasonable amount of your spare time to the necessary study, along sensible lines, in order ultimately to reap a good reward. I would strongly urge upon all parents and those responsible for launching out young hopefuls in photography that the latter get the necessary training outside the studio, for it is infinitely easier in every way to acquire this knowledge while young, than later on, when harassed with greater responsibilities and cares. The result, I am sure, would be a help both to master photographers and assistants.—G. E. H. G.

FORTHCOMING EXHIBITIONS.

December 9 to 31.—Rochdale Amateur Photographic Society. Particulars from the Hon. Secretary, W. Lord, 10, Derwent Street, Rochdale.

1923.

February 5 to March 3.—Northern Photographic Exhibition, City Art Gallery, Manchester. Latest date for entries, January 12. Particulars from the Hon. Exhibition Secretary, Walter Johnson, 30, Hartington Road, Chorlton-cum-Hardy, Manchester.

February 10 to 24.—Scottish Photographic Salon. Particulars from the Secretary, George A. Ross, Northfield Cottage, Brechin.

February 12 to 14.—City of London and Cripplegate Photographic Society. Latest date for entries, January 29. Particulars from the Hon. Secretary, J. J. Butler, 7, Gresham Street, London, E.C.2.

March 1 to 8.—Birmingham Photographic Society. Latest date for entries, February 15. Particulars from the Hon. Secretary, J. E. Breeze, 178, Broad Street, Birmingham.

March 2 to 31.—Pittsburgh Salon of Photography. Latest date, February 5. Secretary, Charles K. Archer, 1,412 Carnegie Building, Pittsburgh, Pa., U.S.A.

March 13 to 16.—Exeter and West of England Photographic Exhibition. Particulars from the Hon. Secretary, R. W. J. Norton, 4, Buddle Park, St. Thomas, Exeter.

March 15 to 24.—Photographic Fair, Holland Park Hall. Secretary, Arthur C. Brookes, Sicilian House, Southampton Row, London, W.C.1.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, December 4 to 9:—

Colour Photography.—No. 33,228. Production of screens for colour photography. R. C. M. de Bercegol.

Colour Photography.—No. 33,656. Natural colour photography. J. Dimsdale and J. Kean.

Cameras.—No. 33,653. Photographic cameras. T. K. Frank.

View Finders.—No. 33,403. View finders for cameras. H. V. Flinn.

Tripod Heads.—No. 33,339. Heads for camera tripods, etc. J. Méry.

Developing Tank.—No. 33,203. Tank for developing, etc., photographic films. M. Rycott.

Process.—No. 33,331. Capillary process of exchange of liquids in photography, etc. L. Lumière.

Telephonic Transmission of Images.—No. 33,655. Telephonic transmission of images. J. Dimsdale and J. Kean.

Projection Apparatus.—No. 33,436. Optical projection apparatus. V. Bridgman.

Photometer.—No. 33,293. Photometer. E. J. Taylor.

Cinematography.—No. 33,595. Apparatus for production of cinematographic films. T. A. Milla and Zoechrome, Ltd.

Cinematography.—No. 33,016. Exposure cinematographs. Firm of C. Zeiss

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

Exposure Meters for Copying, Enlarging and Reducing.—No. 187,077 (August 16, 1921). An indicator which is automatically operated on extending the camera is provided to indicate data

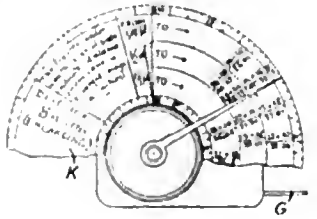


Fig. 1.

Fig. 2.

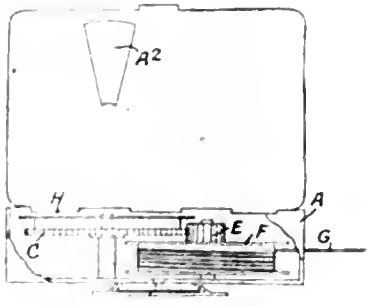


Fig. 3.

which alter with the extension of the lens beyond the infinity point or stop, as, for example, the reduced *f*-value of the lens aperture, the change of exposure required, the degree of enlarge-

ment or other data. The indicator may consist of a pointer rotating with relation to a fixed disc as in fig. 1, or of a disc rotating behind a slot in fig. 4, or of a blind or a simple roller moving behind a slot as in fig. 7. The mechanism for rotating the disc or pointer comprises a cord G, secured to the bellows by an adjustable drum S (fig. 2), adapted when the bellows is extended to rotate a drum F (fig. 3), round which it is wound against the action of a spring enclosed in the drum. This motion is transmitted through cogs E, C, to a dial H, of which the markings are visible through a slot A^2 in the lid of the indicator container A. In this form a second indicator disc K may be mounted on the outside of the indicator case A on a boss J (fig. 5), the boss carrying also an adjustable pointer L^2 with reference to which the inner indicator disc H (fig. 3), rotates. The zero or normal mark on this inner disc acts as a moving pointer for the outer indicator disc. A magnifying lens L^1 may be secured in the boss J to facilitate the reading of the inner indicator. The external indicator may be used alone, in which case the inner

Fig. 4.

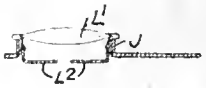


Fig. 5.

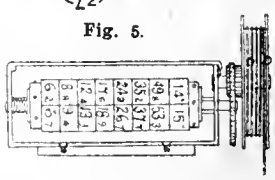


Fig. 6.

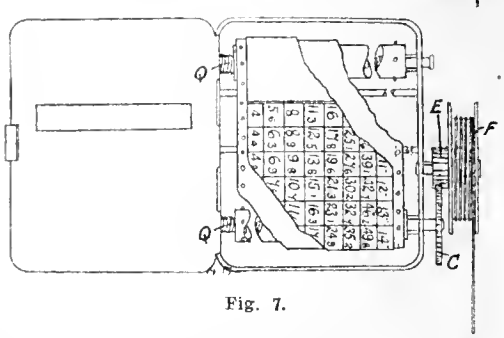


Fig. 7.

indicator is replaced by a pointer. The roller blind indicator, shown in fig. 7, is operated similarly by a drum F and cogs E, C, and is arranged to have its zero adjustable by moving the cog C out of engagement with the cog E against the action of spring Q. The roller indicator is arranged as shown in fig. 6. Various arrangements of the lens data on the indicators are shown on the drawings, and the camera may be provided with a number of interchangeable indicators corresponding to lenses of different focal lengths, the data shown being the *f*-ratios, the various degrees of enlargement or reduction, the positions of conjugate foci, and the duration of exposure compared with that for a like aperture at infinity point or with that necessary for copying full size.—W. G. Rickman, 11, St. Mary Axe, London.

Photographs by Electricity.—No. 188,030. (July 23, 1921.)—A glass plate having a thin transparent metal coat upon which is a thin layer of selenium crystals, is in electrical connection with a battery. A metal plate is connected through a switch to the battery, and between the selenium and the metal plate is arranged a film which is sensitive to electricity. It may be of paper slightly moistened with a potassium iodide or with a cyanide solution. When a photograph is to be taken, the film is pressed against the selenium by means of the plate, and light passing an objective is caused to fall upon the glass. The switch is then closed either instantaneously or for a definite interval of time, with the result that the different portions of the film will be variously affected by the current by reason of the varying resistance of the different portions of the selenium as affected by the incidence of the rays of light. The film can then be developed by any usual process.—Otto von Bronk, 2, Defreggerstrasse, Treptow, Berlin, Germany.

The following complete specifications are open to public inspection before acceptance :—

Colour Photography.—No. 189,813. Process for the rapid production of screens with polychromatic divisions for colour photography. R. C. M. de Bercegol.

Cinematography.—No. 189,774. Method for treating cinematographic films and apparatus therefor. Pathé Cinema, Anciens Etablissements Pathé Frères.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

Novogas.—No. 429,942. Sensitised photographic papers and postcards. L. Gevaert & Compagnie, 23, Sapte Straat, Vieux-Dieux, Belgium, manufacturers of photographic materials. September 24, 1922.

New Books.

The Chemist and Druggist Diary, 1923.—In addition to its diary pages this large volume, issued by our old-established contemporary, contains numerous features which make it invaluable as a daily source of information for pharmaceutical chemists and others. A most valuable feature is the "Buyers' Guide," a classified index to the innumerable chemicals, proprietary preparations and other goods which are sold by chemists. Each entry indicates the various sources of supply in this country. Other literary pages contain a digest of current legislation applying to the sale of spirits, patents and trade marks, income and corporation profits tax, import, stamp and excise duties; and there is even a largely successful attempt to render intelligible the provisions of the National Insurance Acts. The "Diary" is issued to annual subscribers to the "Chemist and Druggist" from the office of that paper, 42, Cannon Street, London, E.C.4.

Sensitometry of Photographic Emulsions.—A "Scientific Paper" (No. 439) has been issued by the United States Bureau of Standards by way of description of the tests and measurements of the characteristics of sensitive photographic materials which have been made during the past few years by Raymond Davis and F. M. Walters, Junr., of the Bureau staff. The publication, which runs to 120 pages, contains a detailed account of the apparatus and methods of testing which have been adopted by the Bureau as standard practice. Whilst both of these are broadly along the lines of Hurter and Driffield, modifications have been made not only in the forms of the exposing and density measuring machines, but also in the manner of expressing the results. The greater part of the booklet is taken up by charts and curves showing the spectral sensitiveness, fog density, characteristic curve, etc., of 86 different emulsions, representing, so it is stated, practically all the brands of emulsion (made in the United States) coated on glass and celluloid. The trade names of the products are, however, withheld. The "Paper" is certainly a contribution to the literature of sensitometry of photographic materials which those interested in the subject will wish to have. It is issued by the Superintendent of Documents, Government Printing Office, Washington, D.C., price 35 cents.

Subject Index to Periodicals.—The compilation of an index providing a key to the chief periodical literature of scientific and technological subjects, which was begun during the war by the "Athenæum," has been continued by the Library Association, 33, Bloomsbury Square, London, W.C.1. A subject index covering periodicals issued in the years 1917-1919 has now been issued as a volume of 555 pages of 12 x 10 inches. It contains 15,000 entries collected from 400 periodicals, representing the chief physical (including biological) sciences and the various branches of technology. Optics and photography have come within this survey, but whilst the former has yielded barely a column of entries, the latter provides particulars which occupy nine columns. The compilation marks an enormous amount of close work done with meticulous care and provides librarians of public or private institutions with a ready means of discovering some item of information which consultants of their collections of periodicals may be seeking. Its usefulness for this purpose would, we think, have been increased had a list of the periodicals which have been examined been included with the index itself. Without such an indication it is not possible to say beforehand whether it is worth while to consult the index at all in the aim of tracing some item which has been known to appear in a given publication. The Index is published by the Library Association itself, price £1 15s. net.

New Materials.

GRIFFIN'S "HAPPINESS" CHRISTMAS CARD MOUNTS.—This series of attractive folder cards, made in two sizes, for ¼-plate or V.P. prints, are supplied by Messrs. Griffin, Kemble Street, Kingsway, London, W.C., in three designs, each printed, in one or more colours, upon fine ivory card. A slip-in section with grey and white border is provided, suitable for both horizontal and upright prints. The mounts are supplied in packets, containing two cards of each design, making six cards in each packet, and the prices are 1s. 6d. per packet for ¼-plate and 1s. 3d. for the V.P. size.

Messrs. Griffin are also supplying an excellent selection of photographic calendars, with cut-out openings for prints. These are made

in various sizes suitable for prints from V.P. to postcard, and in either the upright or horizontal pattern. The mounts are cut from good quality stout card of either grey or brown colour, with a cut-out opening in an overlay of white or cream. Tasteful borders are printed or embossed around these openings, and a calendar is attached to the lower portion of the mount. The prices for these mounts are, for the V.P. and 3 in. by 2 in. sizes, 4s. 6d. per doz.; for ¼-plate and 4¼ in. by 2¾ in., sizes, 5s. 3d. per doz.; and for postcard size, 6s. per doz.

New Apparatus.

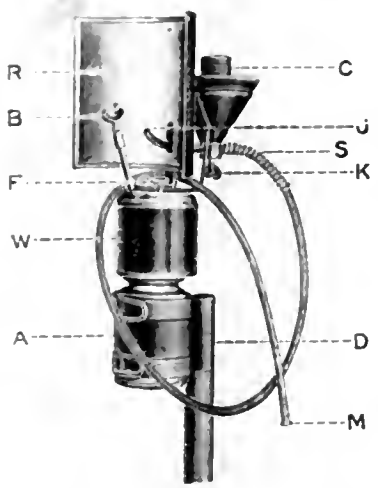
Acetylene-Magnesium Flash Lamp. Sold by Jonathan Fallowfield, Ltd., 146, Charing Cross Road, London, W.C.2.

To the ferrotype worker who anticipates the falling-off of his work during the winter months, owing to unsuitable light, the flashlamp recently placed upon the market by Messrs. Jonathan Fallowfield will come as a boon. At fairs and markets held at this time of the year the camera has to be put aside at an early hour, and when most of the business could be done the light is too bad to allow of even a prolonged exposure. But with this lamp, which includes an acetylene generator combined with a flash-lamp for magnesium powder, the camera will find a new lease and business will be possible at all times and under any conditions. At the cost of only one penny per flash sufficient light may be given for the usual small group, while for single figures the light would be more than ample.

The lamp itself is of excellent design and of strong, substantial make, capable of withstanding heavy, continuous use. It is made in four parts, viz., the carbide container A, the water reservoir W, the magnesium chamber C, and the reflector R. About 4 ounces of lump carbide of calcium are first placed in the lower chamber. The reservoir, which screws to the top of this, is then filled with water and is screwed into position. The magnesium chamber, which is the funnel-shaped vessel at the rear of the reflector, is then filled with pure magnesium powder and the lid securely screwed on. This vessel is then fixed to the top of the reservoir by means of a milled nut working on a bolt, which also provides the means for fixing the reflector in position. The powder jet, J, projects through an aperture in the reflector and its actual position may be regulated by the nut and fork of the powder box. Attached to the lower chamber is a piece of strong brass tube, D, which allows the lamp to be fixed to a broom-handle or other stout stick, which should have a pointed end, and thus, when driven into the ground, make a stand for the lamp.

To start the lamp it is now only necessary to turn the milled head F, on the right-hand side of the reservoir slightly to the right; roughly, two turns are necessary. When water drips from a small tube into the carbide chamber gas is immediately generated and flows along the upright tube to the burner B. After twenty to thirty seconds a light may be applied to the burner and a powerful flame results. This light is now kept burning and serves a double use: not only is it a means of burning the magnesium, but it is also an attraction to customers. At the bottom of the funnel-shaped vessel will be found a key K. This communicates with a valve over a small measuring chamber, and by turning the key into a horizontal position with the light the valve is opened and the measuring chamber becomes filled with magnesium. The key is then turned towards the light and the valve closes, thus preventing powder from falling and ensuring an equal amount being used for each flash. At the rear of the apparatus is a rubber tube M, which is attached to the small chamber. To make the flash the operator has only to blow into this tube when the magnesium is conveyed by means of the jet, shown in the front of the reflector, to the flame. It has been found necessary to have as large a flame as possible to ensure complete burning of the magnesium; but this is an easy matter, only requiring correct adjustment of the water valve. It should be borne in mind that pure magnesium powder only must be used, and not the explosive flash powders.

The only part of the apparatus requiring careful adjustment is the powder jet, which should deliver the magnesium into the hottest part of the flame, for complete combustion. But this adjustment is easily made, and when once found to be correct the milled head is screwed down and the lamp requires no further alteration. A rubber ball fitted with a brass tap may be obtained to blow the powder into the flame if the worker prefers this to the ordinary method of blowing; but this is only a refinement. The price of the lamp



complete as described above is 30s. net, while the ball and tube are supplied for 4s. 6d. extra.

At such a low figure we feel sure that the ferrotype worker will quickly avail himself of the opportunity to possess this equipment, as the first cost would soon be covered by the additional work possible.

A BARNET CALENDAR.—Messrs. Elliott & Sons are distributing to professional photographers calendars for the coming year designed and printed in the bold tasteful style which has been followed for some years. Any professional photographer, who may not have received one, can obtain a specimen on application to Messrs. Elliott, Barnet, Herts.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

WEDNESDAY, DECEMBER 27.

Croydon Camera Club. Conversational Evening.
Rochdale Photographic Society. "Beginners' Troubles."

THURSDAY, DECEMBER 28.

Coatbridge Phot. Assoc. President's Night. R. L. Collins.
Edge Hill Camera Club. "Amateur Photographer," 1921, Prize Slides.
Hammersmith Hampshire House Phot. Soc. "The Plate and the Photographer." C. M. Thomas.
Letchworth Camera Club. "Holiday Slides." Members.
North Middlesex Phot. Soc. "The Autochrome Process." J. F. Nisbett.
Richmond Camera Club. "Flashlight." A. Dordan-Pyke.

FRIDAY, DECEMBER 29.

Rochdale Phot. Soc. "Portraiture." A. Benson Ray.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, December 19, the president, Mr. W. L. F. Wastell, in the chair.

Mr. H. T. Meredith delivered a lecture, entitled "Gravure." The lecturer said he proposed to deal with the question of gravure printing from a practical point of view, and from the standpoint of the large firm catering for this class of work. Processes of printing could be placed under three groups, each characterised by the formation of the printing surface. Typographic printing required a relief image as in the case of illustrations when the image was etched in relief. Planographic processes were surface printing processes, and in this category would be placed ordinary litho. or offset and collotype. The image in these cases presented a flat or unbroken surface. The third group included intaglio printing, in which the image was engraved or etched below the plane surface. The name intaglio really meant carving out, and as an illustration an engraved monogram upon silver could be made to produce a print in the same way as the gravure printing block. The early types of aquatint or mezzo engraving, used a flat plate, which, after inking up and wiping off, could be printed by a hand-press only. These processes were possible before the advent of photography, but photo-aquatint and photogravure were early examples of the use of photography for printing with inks.

Rotary photogravure, as it was now being worked, allowed printing to take place by the aid of cylinders at a high rate of speed, with a consequent reduction of cost. The methods in use to-day were somewhat similar to those used by Fox-Talbot, with the exception that a cross-line screen is now used, while Fox-Talbot had to utilise a piece of coarse muslin. Gelatine, which was used to-day, was probably the medium used in the early process to transfer the image to the metal. The image, in either aquatint or gravure, had to be split up into a fine grain effect, and in these processes resin dissolved in spirit was utilised. After the evaporation of the spirit from the solution coated upon the metal, a fine deposit of resin was left: the metal was etched through this by the aid of aqua fortis, which presumably gave the name of aquatint to the process. A dust cloud of finely powdered resin was also used, the coating being subsequently fixed by heat. In rotary photogravure the cross-line screen was an adaptation of Ives' half-tone screen. The printing in this process was the present-day method of utilising the system employed 70 years ago by calico and wall-paper printers. Photogravure was not patented, but for many years was worked secretly.

The first step in the production of the rotary printing surface was the copying of the original by means of photography. From the negative thus produced a positive was made either upon glass or by the carbon process. No screen was used in either of these sections of the work, but all necessary retouching had to be done either upon the negative or the positive. As a large number of illustrations were required to be impressed from the same cylinder, it was necessary to draw up a dummy sheet of the lay-out. This was done by placing the carbon or glass positives upon a table with a transparent top, and with a series of powerful lamps below. While this lay-out was being placed in position a large sheet of sensitised carbon tissue was exposed beneath a negative of a cross-line screen. The tissue was then given an exposure through the transparencies, and, consequently, two images resulted upon the exposed surface: the illustrations producing a negative image and the screen a positive image. The negative image was thus broken up by the image of the screen into squares, uniform in size, but unequal in density, and each varying in proportion to the amount of light passing the positive. The carbon print was soaked in cold water and then placed upon the cylinder. This was then transferred to warm water, when the paper backing was removed, leaving the gelatine adhering to the metal. Development then took place in warm water, and the gelatine constituting the image became, when dry, the acid resist. Etching was effected in a solution of ferric-chloride, varying in strength according to the depth and tone of the image. A weaker solution of the etching chemical penetrated the film easily, and, therefore, etched deeper and more rapidly than a strong solution. It was thus possible, by varying the strength of this substance, to preserve within limits the actual tone values of the original. After the cylinder had been examined and any defect rectified by the engraver, it was fixed in the printing machine. The apparatus used at the present time supplied the paper from the web or roll, and this, after passing over the stretching rollers, came into contact with the cylinder, and so received the impression. An interesting part of this branch of the work was the actual inking of the cylinder. Thin ink was applied to the printing surface, which thus became thickly coated all over. A thin steel blade, called a "doctor," was then utilised to scrape away the ink from the surface of the cylinder, leaving a deposit only in the etched portion. As the paper passed over this cylinder it was pressed by a second roller, and in this manner was forced to pick up the ink from the sunken image. The paper then passed over heated plates, and so out of the machine. Much experimental work was now being done, said the lecturer, in the endeavour to produce successful colour prints by rotary gravure and some periodicals in America, were to-day being printed in three and four colours in one operation by this process. Upon the proposition of Mr. Marshall a hearty vote of thanks was accorded the lecturer for his clear and descriptive explanation of the process.

CROYDON CAMERA CLUB.

Mr. C. Pollard Crowther, as might be expected, drew a crowded house to hear him on "The Man Behind the Camera."

This worthy person has been heard of before. According to the usual plot, though details may vary, armed only with a spectacle lens set in a cigar-box camera, he triumphs over less gifted competitors furnished with apparatus of the most elaborate kind, which, for the purposes of the play, have been malignantly designed for the express purpose of emphasising their defeat and discomfiture. The moral is obvious, and much the worse for wear.

Thankfully it is recorded that Mr. Crowther's theme was different, and in his usual compelling manner he gave a corruscating sketch of the way in which big men do big things behind their cameras in the studio. Possibly an ultra-enthusiasm for the art of the camera, or possibly long residence among the Japanese, with their Oriental tendency to over-correction in laudatory expression, may be the exciting cause for words of appreciation generally couched in highly extravagant vein. "Bow down to the great masters of the camera, and with adoration regard them and their works," without exaggeration of language, in effect, commands Mr. Crowther.

Mundane mortals afflicted with a sense of the proportion of things may be inclined to reply "Bow-wow!" with no disrespect intended for the heads of the profession, who have done so much to raise its status.

With these preliminary remarks it may be mentioned that the President (Mr. John Keane), in welcoming the visitor, said that all would remember his last appearance, which was in the nature of a typhoon accompanied by incessant thunder-claps. A storm full of excitement and interest, but without any of the discomfort usually attending these convulsions of Nature. It is understood that the R.P.S. has recently weathered the same tempest, and doubtless a full account will appear in its journal, provided the reporter survives his task.

As Jupiter was associated not only with thunder and lightning, but with the growth of the fruits of the field, so the modern Jove is associated with the growth of camera pictures, and he induces a real fertilisation, if a little too rich for hardy plants accustomed to a simple soil. However, it is given to few to make an evening go as Mr. Crowther can, or to arouse hope for better things in the minds of beginners, or instil fresh interest among the photographically jaded.

Among the concrete ideas which emerged at intervals from the thunder-bolts of oratory, a few only were grasped by the club reporter, who experienced a very hot time. Very truly the lecturer said that progress is impossible if the worker cannot appreciate the difference between what is good and what is bad. Precisely, but how this judgment (once obtained, worth nine-tenths

of facile criticism) is to be acquired he did not explain. Probably it can only be arrived at by constant association with what is true and good, and here photographic pictorialism hardly appears to be the best environment.

"The man is eternally dammed who can see no possible improvement in his photography," continued the lecturer, another typical definite pronouncement, even if a somewhat uncomfortable reflection for some. Not quite so precise, if more poetic, was a long exhortation that all should learn to woo light, usually at an angle of 45 deg., to obtain the most sympathetic response.

In the studio the quickest exposure which is *long enough* is the best. He always advised the use of the biggest stop in portraiture, even with lenses of the longest foci. Finally, he said, he was out on a crusade to educate the public in the direction of asking for better things than stereotyped studio productions. From what he knew of professionals, he felt certain that it had only to ask and it would receive. (Applause.)

In the discussion, Mr. Handel Lucas congratulated the lecturer on so ably combining spouting with performance. Artists generally started by mastering detail before adopting the broad style, and he saw no reason why photographers should not do the same. This point might have been made plainer, for the lens maker puts into the hands of all the power to render detail, a work of laborious years with the artist. To combine this detail with breadth of rendering is, of course, another story, and the one doubtless intended by Mr. Lucas, and so taken by Mr. Crowther, who agreed. Being on his legs again, he started another lecture on other topics, a procedure repeated after every question.

Mr. E. A. Salt said the use of large stops with lenses of long foci had its limitations. In portraiture the blur of distant planes often became painfully assertive. Particularly was this the case with the ears. In reference to some remarks about the Marion Iso-Record plate, he could add his testimony to its marvellous speed with artificial illumination.

Mr. H. P. C. Harpur, possibly perturbed by Mr. Crowther's quite impersonal reference to the "eternally dammed," found satisfaction in including the Bromoilist in the same category. He fiercely pointed out that the beloved 45 deg. angle business did not often come off in landscape work. For him, front-lighting every blessed, blooming time. Mr. Crowther dissented: the long shadows in morning and evening should never be overlooked. A most hearty vote of thanks was accorded him with much acclamation.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A meeting of the Council was held at 35, Russell Square, W.C., on Friday, December 8, 1922.

Present: Messrs. Marcus Adams, Angus Basil, A. Bennett, Frank Brown, Gordon Chase, Alexander Corbett, C. F. Dickinson, R. Haines, G. Hana, Herbert Lambert, H. A. St. George, Lang Sims, R. N. Speaight, H. C. Spink, F. G. Wakefield, W. H. O. Wedlake, with the Secretary (Mr. Alfred Ellis) and the Editor (Mr. Jenkyn Griffiths). Mr. Alexander Corbett in the chair.

Arising out of the minutes, the chairman reported that he had not yet been able to call together the committee on co-operative advertising, but a meeting would be held, if possible, before Christmas.

The secretary stated, with regard to a matter in which a member was refused what he considered his rightful fees for commissioned work by a daily illustrated paper, that particulars had been obtained from the solicitor with regard to procedure in the County Court, and had been transmitted to the member concerned; but it had not been necessary to carry it further because the paper in question had since paid the money. On the matter of posting photographs to Italy, a cheque had now been received by the member concerned in settlement; the law on the subject appeared to be that if a customer ordered goods to be sent in a certain way the customer had to accept responsibility for their safe delivery. Mr. Wakefield suggested that all photographs sent abroad should be registered, not that registration assisted very much in making a claim in the event of loss, but it did furnish evidence of receipt.

A dispute, mentioned at the previous meeting, had arisen over a portrait of a Parliamentary candidate sent by a lady to a Press agent, who copied it, and supplied copies to the papers, not knowing that it was the copyright of another photographer. The secretary had written to the Proprietors' Association of Press Photographic Agencies, suggesting that its Council should consider how best to prevent any such friction arising, and had received a reply stating that the matter would be laid before the Council at the next meeting. It was resolved to write to the complaining member pointing out that the infringement was done in good faith, that the offending person was also a member of the Association, and suggesting that he should accept an offer to refund the single fee which had been received for the portrait in question. It appeared, however, that the sitter accepted full responsibility. Mr. Lambert suggested that publicity might be given to the principles governing copyright, and that members supplying copies of photographs should be advised to put a note at the back of the print stating that they claimed the copyright. Mr. Hana said that formerly it was the practice to place on a photograph the words "Copyrighted by ...," but now it appeared that the more correct form was "Copyright of ..." because the photograph was no longer copyrighted by any process of registration. The feeling of the Council appeared to be that "Copyright of ..." was the correct expression.

Letters were also read on the subject of sending films by post, and on the question of cheaper electric current, which had been the subject of previous correspondence mentioned in the minutes.

A letter was read from the secretary of the Society of Master Photographers of Lancashire, which had been asked to nominate one of its members who was also a member of the Association, to a vacancy on the Council. It was stated that the Society had put forward the name of Mr. Fred. Read.

Mr. Chase moved that Mr. Read be accepted on the nomination of the Lancashire Society of Master Photographers to fill the vacancy on the Council until the next annual general meeting, Mr. Haines seconded, and this was agreed to.

Progress was reported on the matter of the Congress and the Photographic Fair, but no new development had taken place since the matter was fully canvassed at the meeting a fortnight previously.

The secretary reported that 347 members owed subscriptions (£173 10s.), of whom 225 owed one year's subscription, and 122 two years' subscription; 194 had not signed the incorporation forms among those whose subscriptions were outstanding, and four who had paid their subscriptions had not signed the forms. He thought it well to wait until the end of the year before taking any further action. He suggested that the advisability of an entrance fee might well be considered.

The secretary then read correspondence relating to various matters on which help and advice had been afforded to members, and in connection with one letter, relating to terms for an apprentice, Mr Brown moved, and it was agreed to, that the question of payment of apprentices should be placed on the agenda of the next meeting.

The chairman, in closing the meeting of the Council, said that he thought the Council was to be congratulated on the attendance at a time of year when photographers were extremely busy. The attendance was very gratifying to himself as President, and very beneficial to the Association. He wished them all from the chair the compliments of the season. He desired also to congratulate Mr. Griffiths on the present issue of the "Record." There were many worries and harrassments attending the production of such a journal, and Mr. Griffiths deserved a meed of praise. Mr. Adams associated himself with these sentiments, which were endorsed by the Council. This concluded the business.

Commercial & Legal Intelligence.

NEW COMPANIES.

Anthony Houghton (Fine Art Co.), Ltd.—This private company was registered on December 11, with a capital of £500 in £1 shares. Objects: To carry on the business of fine art dealers, dealers in pictures, engravings and water and oil colours, picture-frame makers, photographers and printers, teachers of painting, etc. The first directors are: A. Houghton, 35, Church Road, Caversham (manager and managing director); Ellen Houghton, 35, Church Road, Caversham; Lily E. Houghton, 35, Church Road, Caversham. Registered office: 128, Friar Street, Reading.

Kodak Albums. A generously illustrated 16-page list has just been issued by the Kodak Co. of the albums for both professional and amateur use which are supplied by the company. Among the patterns are many attractive styles for prints of small size, one for prints from Kodak Panoram negatives, and also a series of loose-leaf albums. The list is issued for the information of dealers for whom an attractive counter show case, accommodating a selection of the albums, has been prepared.

News and Notes.

NEGOL INDUSTRIAL COLLODIONS, LIMITED.—This firm have taken new offices at Windsor House, Victoria Street, Westminster, S.W.1, to which address all communications should now be sent.

CAMERA CLUB.—The demonstration of flashlight portraiture with an improved form of installation which was to have been given at the Camera Club by Mr. Walter Thomas on January 1 next has been postponed until Monday, January 8.

FILMS SPOILT BY ORE.—A Chicago contemporary states that a photographer of that city had the unpleasant experience of having some exposed films ruined because he placed some samples of high-grade carnotite ore in the safe where the films were stored. The radioactive properties of the ore caused peculiar designs to appear on the films when they were developed.

CITY OF LONDON AND CRIPPLEGATE PHOTOGRAPHIC SOCIETY.—This old-established society in the city of London will hold its eighteenth annual exhibition from February 12 to 14 next. There is an open class in which first and second prizes will take the form of bronze plaques. The last day for the receipt of entries is January 29. Prospectus from Mr. J. J. Butler, 7, Gresham Street, London, E.C.2.

THE N.S. CINE CAMERA ON MOUNT EVEREST.—Messrs. James A. Sinclair & Co., 54, Haymarket, London, S.W.1, have issued two leaflets descriptive of the Newman-Sinclair cinematograph camera with which the many remarkable cinematograph pictures of the Everest expedition were taken by Capt. J. Noel. The films are now being used for the illustration of the fascinating lecture which is being delivered twice daily at the Philharmonic Hall, Great Portland Street, London, W., under the auspices of the Mount Everest Committee.

ROBBINS, MANISTRE BARGAINS.—Messrs. Robbins, Manistre, London Camera Exchange, 2, Poultry, Cheapside, London, E.C.2, send us a newly issued 64 page list of second-hand apparatus. The list fully itemises some thousand separate cameras, lenses, enlargers, and other apparatus, and is even supplemented by a loose 4-page inset which specifies such miscellaneous apparatus as cinematograph-taking cameras, projectors, etc. Throughout the list substantial reductions of prices have been carried out with the object of bringing the quotations into line with current values. Moreover, Messrs. Robbins, Manistre offer a further 10 per cent. discount for cash to bona fide professional photographers.

CATALOGUE COMPILERS PLEASE NOTE.—The "Times Literary Supplement" calls attention to the accompanying very important new regulations with respect to printed matter for the United States and Canada: "The United States Government have issued instructions that all books going to America must indicate the country of origin. British books should have the wording, 'Made and printed in Great Britain' on the reverse of the title page. Otherwise they will be detained by the Customs authorities until the law is complied with. Similarly, the Canadian Government has sent out the notification that the new Canadian Customs Regulation makes it necessary that all printed or lithographed matter of all kinds, books, pictures, etc., must be marked with the country of origin." This regulation came into effect on November 1.

INTERNATIONAL EXHIBITION, TURIN.—The exhibition which is to be held in the spring at the Newspaper Palace, Valentino Park, Turin, will embrace all branches of photography, cinematography, and optics. The photographic section will be divided into seven classes, which include every type of photographic work, together with an exhibition of materials and literature. Pictorial and colour photography may be entered in Class 1, where also a special section for portraits will be included. Class 2 is for press photographs, and Classes 3 and 4 for industrial and scientific photography respectively. For those exhibitors who visit the exhibition, special Custom House and railway facilities will be provided, while the committee, under the direction of Sir Giuseppe Ratti, will undertake to obtain hotel accommodation at reasonable rates. Full particulars of the exhibition may be obtained upon application to the General Exhibition Committee, 26, Via Oepdale, Turin.

HAND CAMERA FOR SNAPSHOTS OR CINEMA FILMS.—"Popular Mechanics" states that there is now being manufactured in America a camera which can be carried in the pocket, operates automatically with the precision of a high-grade watch, and takes either cinema pictures, snapshots, or time exposures simply by pressing a button. No tripod or hand crank is required, the camera being held in the hands and the image located by either of the two methods provided. A metal spring propels the film, at the same time opening and closing the shutter. Loading is accomplished in daylight by means of special metal magazines, six of which are supplied with each camera. The camera weighs less than 4 lbs., measures 4 by 5 by 6½ inches, and is fitted with a high-grade lens capable of producing results equalling the professional motion-picture outfit. Standard-width films are used, and each picture is ¾ by 1 inch. There are four perforations on each side of each picture, making it possible to project the pictures on any standard motion-picture machine. The camera accommodates 15½ feet of film, allowing 248 exposures, or 16 to the foot. The film is moved from one magazine to the other at the rate of 1 foot per second.

CLEANING OIL PAINTINGS.—At a lecture delivered before the Royal Academy on the preservation and cleaning of pictures, Prof. A. P. Laurie said that the question of the preservation and cleaning of pictures was not a purely scientific one, but involved certain æsthetic considerations, and there had been some confusion of thought on the whole subject. To deal first with preservation, it might be necessary, to take an extreme case, where the paint was separating itself from the canvas, to re-line the back or to remove the old canvas and back it with fresh canvas in order to save the picture itself, and this would necessitate the removal of the old varnish and replacing it by new varnish. A picture, on the other hand, might be so obscured by old, dirty, and discoloured varnish as to make it absolutely necessary that it should be cleaned in order to be able to see anything at all. In both these cases some form of treatment was necessary and justifiable.

A picture might have certain flakes of paint off it, and yet be otherwise in good condition, and in such a case it would probably be considered necessary to restore the absent pigment. Here, however, they had to consider on purely æsthetic grounds whether such a restoration was justifiable. In order that the general appearance of the picture should convey to the observer what the artist intended, it was necessary to replace the defective part, but from the point of view of the minute and careful student of the picture it was essential that such replacement should be known. This difficulty could be overcome by the taking of photographs of the picture before repair, so as to put on record what was the work of the master and what the work of the restorer.

With reference to the cleaning of pictures, it might be taken as a general principle that beyond such cleaning, which could be done by wiping with a nearly dry sponge or by rubbing up with turps, no cleaning should be done, unless it was absolutely essential owing to the serious obscuring of the original picture. Cleaning should be done under the most careful observation of experts, who were prepared to stop the process at any moment, and partial cleaning should be preferred to complete cleaning, with the danger of the removal of paint.

While he was not prepared to give a final opinion as to the safest methods of cleaning, he suggested that where alcohol is used castor oil should be laid on the surface with a soft brush, and then a mixture of castor oil and alcohol dabbed on with a soft brush, and removed by diluting with turpentine and sopping up with a large dry brush. Where alcohol is not a sufficiently powerful solvent, copaiba balsam emulsified with ammonia might be used, a preparation of copaiba balsam thinned with a little turpentine being laid on the surface first. If any friction is to be applied it should be done with a soft rubber point, and at every stage examined under a powerful magnifying glass.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE MANIPULATION OF MATT EMULSION PLATES.

To the Editors.

Gentlemen,—As the leading manufacturers of matt-emulsion plates we are interested in your correspondent's communication of last week, relative to the refusal of the matt-emulsion plates to adhere to the support after abrasion.

Contrary to the finding of Mr. A. B. Thomas, no difficulty has been experienced in this direction, the film adhering as easily as in

the case of the non-matted plates, even after treatment with either a hardening bath or immersion in spirit.

Possibly further information may be forthcoming as to the treatment the negative was subjected to, rendering the film non-adhesive under the conditions stated.

The defect, however, can be made good by removing a section of film of like density, from a discarded negative, and, after moistening and dissolving the gelatine, "stippling" on with a "spotting" brush in the usual manner.—Yours faithfully,

ELLIOTT & SONS, LTD.
(F. E. Greenwood, Director).

Barnet, Herts, December 18.

WHAT IS PICTORIALISM?

To the Editors.

Gentlemen,—Mr. Tilney's comments on my Westminster Abbey exhibit rouse a desire to srgufy. The question comes up at once: What, then, do these self-styled Pictorialists mean by "Pictorial?" In his praise of Dr. White's prints, Mr. Tilney seems to be attaching a virtue to what was the chief failing of that time, the mostly inescapable fault of under-exposure. I cannot but feel that if Dr. White had had our plates and developers he would have made his sometimes fine subjects far more akin to the real genius of photography, the charm of full gradation.

Mr. Tilney says, "So Velasquez looked upon his subjects." But Mr. Tilney knows as well as I do that though Velasquez was a superb master of mass and tone, yet when detail was called for he was meticulously accurate and painstaking; look at any of his portraits to prove that.

Mr. Lewis Hind, so says your reporter, was of the opinion that "no painter would give results such as these," referring to my Abbey prints then on the walls during his lecture. If he had said "could" instead of "would," I might have agreed with him! But has Mr. Hind forgotten Turner's early architectural water-colour drawing, or the oil paintings of cathedral interiors by Bosboom and others? What did these "artists" set out to do? They selected a composition that appealed to them, drew it with the utmost care and accuracy in perspective and detail, and gave it what they considered the colours that best expressed it. The only point on which they differ from myself is that they often included far more in their composition than we can; if we used wide-angled (or short-focus) lenses to make their subjects we should get distortion, because we cannot get sufficiently far away; they could imagine the wall behind them to be non-existent, we cannot! Otherwise, except for colour, their procedure is mine exactly; choose a composition, select the hour of lighting that best exhibits it, and then render it in monochrome so that it recalls the original perfectly.

Mr. Tilney says I speak of my prints as "pictures," but that "the elements of pictorialism do not lie very much on the road Mr Evans has chosen in these views." Rather a cryptic utterance, again suggesting the "What then *is* Pictorialism?" I object to the words "record" or "view" as applied to my studies, because they seem to imply something inferior to the creative art of the painter or other artist. But are they? What I mean by a picture in the Abbey is the searching after that aspect of a specially chosen composition that most fully reveals its charm. Each of my studies were possible, were visible, only in the particular hour and kind of lighting that I discovered them in. They are therefore personal to me; no haphazard visit of any other photographer would elicit them. The ordinary visitor does not study, and I do not believe that either Mr. Tilney or Mr. Hind had studied the Abbey at every hour in every kind of lighting to see where the pictures exist. I did; therefore my personal expression of them amounts to creative art—or else what *is* creative art? It is, of course, this revealment, this evocation, by the artist that constitutes picture-making. But because the methods or the results are of a kind or style that these critics or pictorialists would not have made for themselves, they deny the title of "picture" and dub them only records, or representations, or views. But there are countless styles and kinds of picture-making; and the final test is, is the result beautiful, does it ennoble, does it reveal the underlying meaning of the subject, does it evoke the real spirit of the place, does it convey the feeling that it is a personal expression of the worker? If it does, then it matters not whether it is by etching, water-colour, oils, pastels, or by camera. Look through the guide and other books issued year by year on the Abbey—full of "records," "views," never a picture or personal expression in them, any camera by any worker could make them. Does Mr. Tilney class mine with them, only, perhaps, superior in technique or tone rendering?

The camera can do things in the way of light rendering, of subtle gradations of tone, of atmosphere, and in purity of line, detail, texture, that no hand art can excel. It may also have a breadth of expression, a sense of vision, of equal value to hand art; the fact that this is less evident in photography than in hand art only proves that camera workers have amongst them fewer men capable of such vision, or of giving expression to it.

Mr. Tilney says "the pictorial charm of the Abbey is in the very gloom that Mr. Evans dissipates" by his "fetish of exposing for the shadows." I should have thought that the most perfunctory examination of my prints would have shown that the "gloom" was the chief thing I had properly exhibited, not as blank, black nothingness, but with its living depth and wonderful gradation. Gloom is always resolvable to the eye; the grading and detail always come out if patiently studied, and the perfect photograph, or any other rendering, is that which gives the result of this patient study, not the hasty generalised impression of its being merely a dark place. Apparently, however, under-exposure is to be the key to the problems of picture-making. (What *would* Mr. Tilney say if the next Salon or R.P.S. shows were full of subjects as badly treated technically as Dr. White's are!). New rule: Do *not* expose for the shadows, that is only an Evans' fetish; go for black, empty, meaningless spaces with no play of light or depth in them, and there's your picture!

Mr. Tilney compliments me on the historical, architectural and archæological value of my prints. But that is just what I practically ignored or neglected. I do not care a dump what period the building is of, and its history might be non-existent for all I should care; what I wanted to do was to show what the Abbey meant for me, in its extraordinary range of richness of gloom, of light, of atmosphere, its elegance of composition, etc.; to show how human these old builders were, and how full of beautiful ideas they were, what picture-making they aimed at in their aisles, crossings, chapel entrances, etc. If to reveal something of all this is to make "records" only, to be ignorant of Art or incapable of picture-making—well, one is in good company, for Turner, Bosboom, and all the rest of them come under the same ban in similar subjects.

Mr. Tilney says I *admitted* (I didn't know I was on my defence!) that a certain tomb was in darkness, but that I have shown it as transfigured by a lightning flash. (I am glad he did not say "flash light," the effect I particularly loathe for its crude hardness.) What I said was that that particular tomb was black with age, and is so placed that its fine sculptural ornamentation can only dimly be seen, except at one hour, when a side light reaches it, and then its sculptured detail is delightfully visible with the darkness of its shadows so reduced that the tomb is seen in much the condition its maker saw it in. Surely it would be mere madness for an artist not to "record" it in its proper and most favourable lighting. To depict it as a mere dark mass with scarcely a hint of its sculptured detail would be senselessly inartistic.

I would like Mr. Tilney to look—I think he *must* have missed it before—at my version of the tomb of the Buckinghams. As I told the meeting, this was an impossible subject, because of a white glass window staring into the lens from behind the tomb. But by careful sky-shade use and making the frame of the door of the chapel help cut off the window, I secured a rendering of the tomb with its figures well lit up, but all other details submerged, and only the radiance from the window as a background. If this is not creative picture-making, what on earth is it? I made it; it does not exist except in my platinotype print.

Mr. Tilney says "as soon as the enchanted beholder adjusts his vision from the broad responsiveness to the acute searching of detail he has finished with the picture." Not necessarily or wholly, even in the beholder, and certainly not with the artist who depicts it. He must do both, convey the "thrilling play of darkness and light" *with* a commensurate rendering of its details (unless he is working with pen and ink devoid of shading), or else the full picture message will not be delivered. I will cheerfully and confidently refer Mr. Tilney to my print, "South Transept into Aisle and Nave," as an example of this. It is an effect I saw but once in the Abbey in that intensity, and as I pointed out to the meeting it is a good instance of the handicap that photography suffers under and prevents it ever having the complete freedom of hand art. The gloom of the Abbey was intense that day, but was irradiated in aisle and in nave by shafts of sunlight on their walls. If that sunlight had not lasted long enough to render a full exposure possible (under-exposure would have been blue ruin only), the picture would not have been caught. A painter might by a rapid sketch have memorised the effect for after working up. Even our glorified "faking" could not do that. But I did get it, and there it is, as

fine an example of "thrilling play of darkness and light" as I have ever made or hope to. It must be going on for a quarter of a century since my friendship with F. C. T. began, so I can the more gamely now adjure him to "come on!"

FREDERICK H. EVANS.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

T B.—The firm for Heliolettes is now Messrs. Jefferies & Co., Ltd., Pembroke House, High Road, Seven Kings, Essex.

BLUE PRINTING.—The book you mention is "Ferric and Heliographic Processes," by G. E. Brown, now out of print, but possibly obtainable from Messrs. W. & G. Foyle, Ltd., 121/125, Charing Cross Road, London, W.C.2.

A. O.—The trouble is entirely due to the rusty conditions of the dishes. We should advise you to discard these altogether and use either wooden or xylonite dishes in their place. Painting and enamelling the old dishes would be useless.

J. S.—The stain occurs in the film of the plate owing to its extra thickness, but we think you may easily remedy this by adding, say, 5 per cent. extra sulphite. More bromide would give greater contrast, and this, we take it, you do not want.

REFLEX.—We should say the spring controlling the blind has become weak and requires renewing. You should send the camera to Messrs. Peeling and Van Neck, Ltd., 4-6, Holborn Circus, London, E.C.1. This firm makes a specialty of focal-plane shutter repairs.

X. M.—The lens would be most suitable for studio work, especially large heads, but it would not be better than the anastigmat for groups. We should choose the latter under your conditions, as the lens is apparently required more for commercial work than portraiture.

M. V. R.—If the print refuses to ink, we should imagine it has been soaked in water of too high a temperature. It would be best to dry the print and then re-soak in water at a much lower temperature. The opposite applies if the print takes ink all over, but this may also be due to either unsuitable paper or bleaching bath.

PRO.—(1) Lithographic ink may be used, but it is necessary to have some little experience of the process before the best results may be obtained with this substance. (2) The Bromoil brushes supplied by Messrs. J. A. Sinclair & Co., Ltd., 54, Haymarket, London, S.W.1, are most suitable. (3) No; stencil brushes are useless.

J. T.—The general lay-out of your dark room seems quite satisfactory. Certainly, the window should be fitted with a blind moving in grooves. Messrs. James A. Sinclair & Co., Ltd., 54, Haymarket, London, S.W.1, make such a fitting which allows the room to be instantly converted into a dark room by merely pulling the blind.

S. E. E.—Yes, it is quite possible to place a colour filter in the front of the spotlight: in fact, the makers of these lamps supply various filters mounted in frames which fit the grooves in front of the lamp. A yellow filter could be used when working with panchromatic plates, but we do not see how the exposure could be any less than if a filter was placed in front of the lens.

L. S.—The trouble is due to some object which was in front or behind the lens during exposure. As you are getting the patch of lesser density in each exposure, we should advise you to examine the inside of your camera. We believe the trouble will be found to be due to a portion of the material of the bellows which has frayed out and is in the path of the light from the lens.

C. R. E.—The type of photograph you mention may be easily produced by means of a pinhole. A box is taken, capable of holding a plate, of the size with which it is intended to work, in an upright position, about 2 inches from one end. At this end the pinhole lens should be fixed. If you then place the pinhole about 6 inches from the sitter's face and give sufficient exposure you will get the effect you desire.

C. B.—A good method is to first fog a dry plate and develop it to an even tint of grey, then fix, wash and dry. This is then placed in a printing frame in the dark room and a slow plate placed in contact. Exposures are then made to candle-light at about 6 inches distance, commencing at, say, 2 seconds and increasing in any known ratio until the 12 strips are exposed. The exposed plate is then developed in a clean non-staining developer.

M. B.—Matt varnish may be made as follows:—

Sandarac	90 grs.
Mastic	20 grs.
Ether (0.720)	2 ozs.

Dissolve the resins in the ether and afterwards add:—

Benzole	¼ to 1½ ozs.

The quantity of the benzole added determines the nature of matt effect obtained. Apply the varnish cold to the glass side of the negative.

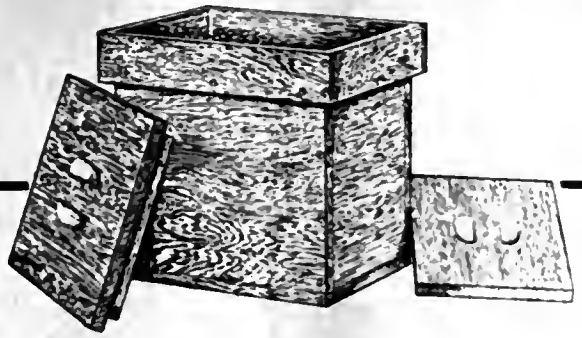
COLOUR.—Yellow or three-colour filters are supplied in gelatine by all the leading makers, including Messrs. Ilford, Ltd. These filters, when cut to size, may be placed in the tube of the lens between the components. We think, however, it would be better to obtain the three-colour filters in optical flats, as you will find a difficulty in changing the gelatine circles between each exposure. If you send the measurement of the outside diameter of your lens hood when ordering the filters, the makers will supply the filters in cells which will fit.

P. L.—Hydroquinone accelerated with caustic soda is the best developer for obtaining contrasty results. If the plates are over-exposed, double the quantity of potass bromide.

A. Hydroquinone	160 grs.
Sodium sulphite	2 ozs.
Citric acid	60 grs.
Potass bromide	40 grs.
Water to	20 ozs.
B. Caustic soda (stick)	160 grs.
Water to	20 ozs.

For use take: A, 1 oz.; B, 1 oz.; water, 2 ozs.

The temperature of the developer should not be allowed to fall below 60 deg. F., or the solution becomes inert.



Eastman Portrait Film Developing Tanks

Teak Developing Tanks will enable you to develop your films more quickly and economically than you can with the old fashioned dish method. Tank development gives you clean, crisp negatives, free from finger marks and scratches. Eastman Portrait Film Tanks are coated inside with an acid-resisting preparation. They are strongly made of well seasoned teak. They are exceedingly durable and.... but read what Mr. James A. Hamilton says about the Teak Developing Tanks.

CLYDE STUDIO,
11, Broad St.,
Staple Hill,
Nr. Bristol.

James A. Hamilton,
Artist & Photographer.

To Kodak Limited,
Kingway, W.C. 2.

Dear Sirs,

In respect to the Film Developing Tank you sent me for trial, I must say I am more than delighted with it. I have been all my life in the photographic business—born in it, been 26 years on my own account, and had never tried Tank development before, and *I shall never go back to dish.* It is so clean and certain. I came to grief a little at first by either over or under-development, but now I am getting splendid negatives and no trouble. I must thank you for inducing me to try it—it is splendid.

(Signed) J. A. HAMILTON.

Size No. 2. Capacity—Eight 6½ × 4¾ in., or 5½ × 3½ in., or 4¼ × 3¼ in. Tank only **19/-**. Cover **6/6**. Floating Lid **2/-**.

Size No. 3. Capacity—Twenty 6½ × 4¾ in., or 5½ × 3½ in., or twelve 10 × 8 in., or 8½ × 6½ in. Tank only **£1 6 6**. Cover **9/-**. Floating lid **3/-**.

Size No. 4. Capacity—Twenty-five up to half plate or fourteen 12 × 10 in., or 10 × 8 in., or 8½ × 6½ in. Tank only **£2 0 0**. Cover **11/3**. Floating lid **4/3**.

Kodak Limited,
Kingsway, W.C. 2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3269. Vol. LXIX. FRIDAY, DECEMBER 29, 1922. Price Fourpence.

Contents.

SUMMARY.

The Index to the 1922 volume of the "British Journal," and to that of the "Colour Photography" Supplement, is presented as a supplement to this issue.

Mr. A. H. Hall has made systematic experiments on the effect of the possible variations in the working of the Carbro process upon the character of the prints as regards tone rendering. (P. 783.)

MM. A. & L. Lumière and A. Seyewetz have made experiments on other quinone compounds for intensification of negatives and toning of prints and transparencies, and have found that halogenated quinones behave like benzoquinone and that toluquinone is the best further compound for toning. (P. 785.)

Some notes on the making of enlargements in colour as a sideline in the trade of developing and printing for amateurs are contributed by Thermit. (P. 785.)

The report of the committee appointed by the Board of Trade, under the Safeguarding of Industries Act to hear a complaint respecting the sale of cameras, photographic lenses and other goods of German manufacture, was published on Friday last, December 22. So far as concerns cameras and lenses, the committee have expressed the opinion that the applicants' evidence was insufficient to show that these goods are being sold in Great Britain at prices lower than those at which they can be profitably manufactured in this country. The parts of the report which relate to cameras and lenses are reprinted on pages 786-788, and will be found to contain some interesting official statistics respecting the importation of cameras during the past two or three years.

In a note on page 781 we refer to the official machinery provided in the Safeguarding of Industries Act for the making of a "complaint" in respect to goods which, it is alleged, are being "dumped" into this country.

In a leading article we offer some suggestions to professional portraitists on the personal manner which helps towards the making of characteristic likenesses of their sitters. (P. 782.)

In the King's Bench Division of the High Court last week judgment was given in a case of copyright infringement (of a musical work), when it was held that the authorising of performance of the music constituted infringement, even though the "authorising" consisted in neglect to prevent the performance. The judgment will be found on page 790, and our comment upon it on page 781.

Cleaning originals before copying, and the making of a novel plate-rack, are the subjects of "Assistants' Notes." (P. 788.)

For the cleaning of Bromoil brushes, and also for removing the pigmentation from a Bromoil print, carbon tetrachloride is much to be preferred to petrol. (P. 782.)

Mr. J. B. Payne has retired from the chairmanship of Mawson & Swan, after a connection with the photographic industry of more than sixty years. (P. 791.)

Croydon was in a Christmassy mood last week in finding analogies to emulsion constants. (P. 789.)

EX CATHEDRA.

Copyright Infringement by Authorising

In delivering judgment last week in the High Court respecting an action for infringement of the copyright in certain musical works, Mr. Justice Rowlatt had to lay emphasis upon a passage in the Copyright Act on which, so far as we remember, a case has not turned; at any rate, not a photographic case, although the circumstances might easily arise in connection with photographs. The passage is the last line of Section I (2) of the Copyright Act, which provides that the authorisation of any of the Acts which are an infringement of copyright is itself an infringement of the copyright. The case before the Court was that of a firm of theatrical producers who had been sued by the owners of rights in respect to the unlicensed performance of certain music between the acts of a play. One of the defendants was managing director of the theatrical producing firm, and in that capacity was responsible for the music which was played in the intervals of the performance. Apparently, the fact that he did not prevent the performance of the copyright music (it was the conductor of the orchestra who selected it) is held in law to be equivalent to his having authorised its performance. The judgment has an obvious application to cases which could easily arise in the reproduction of photographs, as, for example, those in which a person authorises the reproduction of a photograph of which he does not hold the copyright. It has long been recognised that a person who definitely orders a work to be reproduced is equally liable, as regards infringement, with the actual copyists. The passage in the 1911 Act, to which we have referred above, states this provision in a somewhat different way, whilst the judgment of last week serves to show the wide meaning which may be given to "authorise."

* * *

German Scientific Goods.

The Report has just been published of the Committee appointed by the Board of Trade in May last for inquiry into a complaint respecting the sale in this country of optical and other scientific instruments, including cameras and photographic lenses, manufactured in Germany. On another page we print the parts of this Report which relate particularly to photographic goods. Here, it may be of service to point out that Part II. of the much-discussed Safeguarding of Industries Act provides certain machinery for the purpose of preventing the "dumping" of foreign goods into this country. According to Section 2 (1) a "complaint" can be made to the Board of Trade that, in the opinion of the complainant, goods are being sold in this country (*a*) at prices below the cost of production, or (*b*) at prices which are below those at which the goods can be profitably manufactured here owing to depreciation of the currency of the country of origin; and further, that from one or other of these

causes employment in the respective industry in the United Kingdom is seriously affected. Taking advantage of this provision, several trade associations, among them those connected with the manufacture of photographic and optical apparatus, lodged a "complaint," whereupon the Board of Trade followed the course laid down in the Act, namely, of appointing an independent committee to hear the evidence of the complainants and that of any opponents. As will be seen from the Report no evidence was submited by the complainants regarding cost of production in Germany. On the alternative question, the Committee's Report is that the evidence respecting cameras and photographic lenses was insufficient to convince them that the German articles "are being sold or offered for sale generally or on a commercial scale in the United Kingdom at prices below those at which similar goods can be profitably manufactured in this country." While pointing out that their report was presented at a time (July last) when German currency stood at about 2,300 marks per £ sterling, they particularly emphasise, in regard to cameras, that the number imported from Germany is only a small proportion of the total trade of the United Kingdom in these goods, a view which they support from the official Customs statistics presented in tabular form in the Report.

* * *

Cleaning Bromoil Brushes. The technique of the Bromoil process has made great strides recently, and much of its uncertainty has been overcome by careful experiment. The literature of Bromoil has accordingly grown rapidly, but not much has been said about some of the minor, but still important, details of the process. Among other items, when the process was introduced, petrol was recommended for brush cleaning, and that is still the case now. Petrol has one or two drawbacks in use—it is never quite free from greasy substances, and therefore leaves a greasy deposit in the brushes after it has itself evaporated; and although this deposit may be small, it is sometimes enough to interfere with inking when the brushes are next used. Petrol is also very inflammable. A liquid which evaporates much more completely, and which refuses to take fire, is carbon tetrachloride. The name is admittedly more formidable than petrol, and local dealers may be found unfamiliar with the substance. It is, however, readily obtainable from large chemical dealers and sundriesmen, and its price is quite reasonable. The use of carbon tetrachloride is not confined to brush cleaning. It may be used with equal satisfaction for removing the ink from a Bromoil which is unsatisfactory; and it is also a perfect substitute for petrol for removing grease spots from clothing.

* * *

Bleach Prints. The aid of the photographer is very often called upon by the commercial artist or draughtsman to make prints, either of articles or of existing drawings, to specific sizes, in order that they may form part of a "lay-out." In other cases the print is merely used as a basis for a line-drawing in waterproof ink, the photographic image being dissolved away when the main work has been done. A photographer who has a convenient copying arrangement, and whose premises are in a strictly commercial neighbourhood, can make a very useful side-line of this work, but there are individual likes and dislikes among artists that should be studied if the work is to be profitable. The principal consideration may be summed up in the familiar slogan of the engraving and printing trades, "Time is the essence of this contract." Some artists like to make their line drawings upon a tracing linen or paper pinned over the photograph, instead of utilising the bleach-out method; in such cases obviously a vigorous print somewhat on the dark side is indicated. On the other hand, for the majority who still prefer the bleach method, an over-exposed print, developed in a diluted and restrained solution giving a weak greeny-grey result, will be the best, as the hand work will show up much more clearly as it progresses than upon a normal bromide print. Such a print bleaches out in the iodine bath in a very few seconds, and there is less for the subsequent fixing bath of cyanide to remove.

EXPRESSION IN PORTRAITURE.

If we except those sitters whose only desire is for a "pretty" portrait, we shall find that the great desideratum is a portrait with a pleasing or, perhaps, more correctly, a characteristic expression. More than one well-known portraitist can tell of sitters who, after he has expended the utmost of his skill upon them without success, have produced a snap-shot print and asked whether it could be enlarged and finished, because "it was the best portrait they ever had." Such happenings give food for thought on the part of the portrait artist, as to the way to avoid such humiliation in the future.

We should hardly like to refer to the oft-quoted story of Sir Joshua Reynolds, in which he is said to have wished to dine with a sitter before painting his portrait, did it not convey such an obvious lesson to anyone engaged in portraiture by any method. Here the painter wished to study his model at his leisure, carefully noting any little mannerisms, and particularly his expression, at the most favourable moments, so that the actual sittings were more devoted to drawing than to the study of expression, which was at this stage often marred by self-consciousness.

The photographer is in a much less favourable position than the painter, because not only has he less time to take stock of his sitter, but he has no opportunity of modifying his work as it goes on. It is just a question of an exposure of a few seconds at the psychological moment, and success in these circumstances calls for a combination of qualities which are rarely found in human nature.

Every class of society has its own peculiar amenities, and the methods which are suitable for one are out of place with another. Still, there are certain attributes which may be considered as general to operators of all classes, and we cannot do better than endorse the advice of Shakespeare to "assume a virtue though you have it not." Long experience teaches that in the vast majority of cases the sitter is a faithful mirror of the operator. If the latter be fussy and inclined to be irritable; if he be slow and self-absorbed; if he be unduly obsequious, or on the other hand arbitrary or overbearing, these will certainly have a deleterious influence upon the sitter. If, on the contrary, the operator be vivacious without being boisterous, courtly without being servile, and well informed upon such matters as are likely to interest his client, the latter is placed at his ease, and is likely to assume an expression which will be acceptable to his friends.

The arts which evolve a favourable expression must be carefully concealed from the sitter, or they will fail, and particularly is an excess of words to be avoided. We have heard operators of both sexes who have cackled (there is no other word for it) to the sitter during the actual exposure, and the worst of it was that the cackle was not even intelligent, attempts at sporting talk being on the level of Ouida, who described her hero as pulling two strokes to every one of the rest of the crew in a

'Varsity boat race. It is the experience of most successful workers that the less said during the actual process of posing and exposing the better, if the sitter can be put *en rapport* with the photographer at an earlier stage. A few words of appreciation, real or simulated, will often work wonders in securing a satisfactory expression, but these should only be uttered a moment or so before the bulb is pressed. Such sentences seem trite in print, but they are effective at the moment. A remark that there is a beautiful light upon the hair, gives rise to the idea in the sitter's mind that her hair must be beautiful, and the portrait reflects the "flattering unction" which has been laid upon the soul. It is surprising how much indirect flattery can be used, upon both sexes, without detection, and, indeed, how much direct flattery too, if there is no one else in the studio to hear it.

The great pitfall to be avoided is undue familiarity, and it is very difficult to say at what point this commences, so much depending upon the personality of the operator. What may be said without offence by a dignified veteran becomes unpardonable in the mouth of a man in the thirties, because it is assumed that the one is speaking from long experience and as an artist only, while the other is giving his personal opinion as a man.

Could we mention names we could give instances of failures which have been entirely due to an unfortunate personal manner on the part of the photographer, which has rendered the highest skill and the most unflagging industry worthless, while, on the other hand, a very moderate amount of photographic ability joined to a pleasing manner has spelled success. The public will endure faulty technique, bad posing, and almost any other artistic fault, but they will not forgive a bad expression, hence the success of the snapshot. It is well to remember this when tempted to spend too much time in arranging drapery or altering the pose, as it is so easy to weary the sitter and so lose all prospect of getting a good expression.

Brief mention must be made of the influence of the surroundings in the studio and reception room upon the sitter. Scrupulous cleanliness, well-chosen ornaments and furniture, fresh and healthy flowers and plants, all play an important part in producing a pleasing impression on the mind of the client, and no studio is too humble to be able to disregard this hint.

EXPERIMENTS ON CONTROL IN CARBRO PRINTING.

The writer is of opinion that there is no method of printing which gives such fine results to the worker who confines himself to a hand camera, and consequently uses small plates, as the Carbro process, unless, of course, he is prepared for the trouble of enlarged negatives and contact prints. In the course of making a considerable number of prints by this process certain results were obtained which did not quite fit in with what was expected; the number of variables which occur between the commencement of operations and the finished print make it difficult to determine what is exactly the cause of any particular variation. It was therefore decided to carry out a series of systematic experiments, altering one variable at a time, and to tabulate the results.

To eliminate one variable at the start, the question of the No. 2 solution is worth consideration. Early experiments with formaline purchased fortuitously gave good results, but the time of immersion in the solution with different samples was variable and longer than with the materials supplied by the Autotype Co. The druggist supplies formaline presumed to be B.P. strength, i.e., 36—38 per cent., but it appears to be rather a variable quantity. The solution shown in Table 2 was known to be out of a new stock, and the results are similar to those with Autotype solution. To eliminate this variable, however, it appears advisable to buy the solution from the source.

The method adopted was to take a certain number of prints, cut them in pieces, and take Carbros off each piece. When dry the margins were cut off and the parts pieced together, as it is considered that this method enables slight variations in density and contrast to be readily detected. As a species of cross check some of the later experiments were conducted with pieces of the earlier bromides; when finished, as will be seen from the notes at the bottom of the tables, these pieces fitted in with the earlier prints extremely well.

The writer is not possessed of a laboratory, but the conditions were certainly kept as constant as will usually be found in everyday working; the temperature of the room was carefully measured each time, and did not vary more than 5 degrees, the range being 60 deg. F. to 65 deg. F., and the temperature of the solutions varied to a somewhat less extent, certainly not more. As the temperature of the developing water has a considerable effect on the depth of the print, great care was taken to have a good volume and start operations on each print at exactly 91 deg. F. As soon as the backing was stripped, steps were taken, by agitating the print and by pouring water on to it, to remove all the freely soluble gelatine and pigment as quickly as possible. As soon as the print was clear it was rinsed in cold water and placed in the alum bath. No attempt, of course, was made by prolonged immersion, or by the use of hotter water, to lighten a test piece which would normally be considered too dark, nor were contiguous pieces off one bromide compared until they were ready for drying.

It did not appear useful to vary the time of immersion of the tissue in No. 1 bath, as it should be saturated with solution.

The places where variations might occur were:—

(1) Time of immersion in No. 2 bath.
(2) Strength of No. 2 bath.
(3) Time of contact with bromide print.
(4) Time of contact with transfer paper before development.

The tables below give the results, while the notes on the tables refer to the cross checks previously mentioned.

VARYING TIME OF IMMERSION IN No. 2 BATH.

Constants (1) Time of contact with bromide, 15 minutes.
(3) " " transfer paper, 30 minutes.

No. of print.	Make of paper.	Type of print.	Time of immersion (secs.).	Appearance of bromide print after contact.	Result.
1	Illingworth	Normal, no heavy shadow	0	Completely bleached	All half-tones washed up.
2	"	"	5	"	A good deal of washing up.
3	"	"	10	"	Correct.
4	"	"	15	"	"
5	"	"	20	"	"
6	"	"	25	"	"
7	Wellington	Strong, rather heavy print	10	Darker portions unbleached	"
8	"	"	20	As No. 7.	"
9	"	"	30	A considerable portion of print unbleached.	Distinctly flatter, less depth in the shallows.
10	Vitegas, bleached and re-developed.	Strong, heavy print.	15	Completely bleached.	Correct.
11	"	"	30	"	"

VARYING STRENGTH OF NO. 2 BATH.

Constants: Time of contact with bromide, 15 minutes.
" " transfer paper, 30 minutes.

No. of Print.	Make of paper.	Type of print.	Strength of solution.	Time of immersion (secs.).	Remarks.
12	Illingworth.	Normal.	A, normal strength.	15	All four pieces joined up without much difference in density and contrast. The quality of 12 and 13 was apparently slightly better than 14 and 15.
13	"	"	B, normal strength.	15	
14	"	"	B, half strength.	30	
15	"	"	B, quarter strength.	60	

NOTE.—A solution is Autotype Co.'s make.
B solution contains formaline B.P. strength, purchased from a druggist.

VARYING TIME OF CONTACT OF TISSUE AND BROMIDE.

Constant: Time of contact with transfer paper, 30 minutes.

No. of Print.	Make of paper.	Type of print.	Time of immersion. (secs.).	Time of contact. (mins.).	Remarks.
16	Illingworth.	Normal.	15	22½	No effect.
17	Wellington.	Strong print.	30	22½	Full depth.
18	"	"	30	10	"
19	"	"	30	5	"

NOTE.—No. 16 is part of print represented by 20, 21, 22; the four pieces join up together well.
No. 19 is a duplicate of 25, and both are of the same depth; the same applies to 18 and 24.
Nos. 18 and 19 show a trifle more contrast than 24 and 25; there was not much difference in the amount of bleaching between 17, 18, and 19, 17 was rather more bleached; but the results were clearly not proportional to the time.

VARYING TIME OF CONTACT OF TISSUE AND TRANSFER PAPER.

Constants: Time of contact with bromide, 15 minutes.
Temperature of development, 94° F.

No. of print.	Make of paper.	Type of print.	Time of immersion in No. 2 (secs.).	Time of contact. (mins.).	Remarks.
20	Illingworth.	Normal.	15	30	Normal.
21	"	"	15	50	"
22	"	"	15	60	"
23	"	"	15	12	"
24	Wellington.	Strong print.	30	12	"
25	"	"	30	60	"

No. 23 is a duplicate off the same piece of bromide as No. 4, and joins up well with 3, 5, 6.

The general trend of the results was a little unexpected. It was known that Illingworth's paper in normal working required less time in No. 2 bath than Wellington's, and the appearance of the bromide print when stripped from the pigmented paper is interesting.

In every case with Illingworth's paper (the prints were not very dark) the print was completely bleached, and the results tend to show that, given complete bleaching, none of the variations attempted has any effect on the ultimate result. Alternatively, there is not much object in continuing contact between the bromide and the tissue when bleaching has become complete.

With Wellington paper the prints used were rather dark. Some black was always apparent on stripping, and where the times of immersion in the No. 2 bath were long the amount of bleaching was less than where it was short.

This only confirms the published directions that short immersion gives depth and long immersion gives flatness, but with this limitation that it is not possible to increase depth over that which would be obtained as a straight transcript from the bromide, though some control in lessening the depth is possible.

It was not anticipated that so short a period as five minutes in contact with the bromide would give full depth, though the print was a dark one to start with. Further experiments with Illingworth paper gave results which were a trifle too light. It appears better, as stated below, to adhere to the standard fifteen minutes.

Another practical point which was clearly shown in these trials is that a print on black tissue looks slightly darker than one of brown colour, and this might be useful if a print was required from a rather light bromide.

The increased length of time between putting the tissue on the transfer paper and development did not, as is generally supposed, require hotter water. The time which elapsed before it was safe to strip the backing was certainly longer, but this may well be due to the tissue having dried somewhat more; there was no difficulty in developing a print, which had received sixty minutes' contact, with water at 94 deg. F.

In the writer's opinion, therefore, the amount of control possible by a long contact with the transfer paper is very small, the extra depth, if any, which could be obtained by this means is nothing more than could easily be washed off by hotter water without fear of blisters. Possibly a longer contact than one hour might have had some further effect.

It is therefore considered that the best method of procedure is to standardise the length of immersion in No. 2 bath at twenty seconds, with fifteen minutes' contact with the bromide, and thirty minutes' contact with the transfer paper, and make the bromide of such a depth that on stripping it will be found to have just a trace of black in the shadows.

This means that a print on Illingworth's bromide paper should be very considerably darker than on Wellington's; in fact, it should be a trifle darker than would be required for sulphide toning, while the Wellington print should not be darker than normal; if anything a shade lighter.

It is not advisable to make darker prints than described, as an increased time in No. 2 bath tends to impair the depth in the shadows, so that the beauty of the process is lost.

It may be useful to state the experience with various makes of bromide paper which have been tried:—With Kosmos, Criterion, Kodak, a good rich print a trifle darker than on Wellington is necessary. Paget should be half-way between Wellington and Illingworth.

Vitegas and Vittex Gevaert (after bleaching and re-development) require a print as dark as Illingworth's. All the above refer to matt papers; the semi-matt in the writer's hands have given considerable trouble with uneven patches.

Generally the best method is to have the right bromide for the particular paper used, to standardise the times, and rely on hot water for control, except in the case of very hard prints, when the time of immersion in the No. 2 bath can be increased somewhat.

A. H. HALL.

QUINONE COMPOUNDS IN INTENSIFICATION AND TONING.

IN preceding papers* we have shown that the remarkable oxidising properties of benzoquinone may be employed for the reduction of silver images, by using a solution containing sulphuric acid, and also for the intensification of negatives and toning of transparencies and prints by compounding the benzoquinone with a bromide or chloride. The theory of these actions, which appears most probable, has been outlined; and the properties which we have described have already been found of some service in photographic processes.

In the course of further experiments we have endeavoured

* "B.J.," 1910, August 19, p. 625, and December 16, p. 949; 1921, January 7, p. 6. For other references, see "B.J.," 1921, February 11, p. 74.

to ascertain if the above properties are peculiar to benzoquinone, or if they are exhibited by various bodies containing the quinone group, such as chloro, bromo, and sulphonated quinones and higher homologues.

Our experiments were carried out with monochlorquinone and its sulphonate, dichlorquinone, monobromquinone, and its sulphonate, toluquinone, naphthoquinone and anthraquinone.

The naphthoquinone, and also anthraquinone, used with sulphuric acid or with addition of bromide or chloride, exert no appreciable action upon the silver image; the other quinone compounds act very similarly to benzoquinone, although showing certain differences. The sulphonic derivatives (sodium salts), although possessing the advantage of more ready solubility, are not of practical interest, since they stain the medium and give results which in all cases are inferior to those obtained with the corresponding non-sulphonated quinone.

The chlor and brom quinones, with addition of an alkaline bromide or chloride, yield images which are more opaque than those obtained with non-halogenated quinones, probably because the chlorine or bromine in the compounds themselves form chloride and bromide of silver. This hypothesis appears to be confirmed by the fact, which is mentioned later in the present paper, that hypo reduces these images to a greater extent than those which have been bleached by a solution of a non-halogenated quinone.

The colour of the images and their degree of intensification vary according to the particular quinone which is used, but among the substances examined toluquinone alone was found to give results of substantial value for intensification or toning.

The degree of intensification which is given by toluquinone may not be equal to that yielded by benzoquinone, but, on the other hand, the intensified images are more transparent and of an agreeable purplish-red colour, of which advantage can be taken in the toning of transparencies.

The following is a comparative statement of the results obtained with benzoquinone, toluquinone, and chlorquinone, in conjunction with alkaline bromide for intensification of negatives and for the toning of transparencies and prints.

Intensification.

Benzoquinone. — Energetic intensification, brownish-red image, somewhat opaque, but toning to a dark brown in alkalis, sulphites, or bisulphites. Hypo reduces the toned image and increases its transparency without altering its colour.

Toluquinone.—Intensification somewhat less than with benzoquinone; transparent purplish-red image, with exceeding pure high-lights. The image is changed to a purplish-black by alkalis, sulphites and alkaline bisulphites. Hypo reduces the image without changing its colour.

Chlorquinone.—Intensification less than with benzoquinone, yielding an opaque image of yellowish-brown colour. Hypo greatly reduces the depth of this image, but does not alter its colour.

Toning.

The three preceding quinones produce very slight intensification of fine-grained images, and, in the toning of black transparencies, give the following results:—

Benzoquinone.—Transparent image of sepia-brown colour.

Toluquinone.—Transparent image of purple colour similar to that obtained by gold toning.

Chlorquinone.—Opaque image of reddish-brown colour.

The tones obtained on development papers correspond generally with those on transparencies, but the tones are not quite as bright, and the high-lights suffer a certain degree of tinting.

From our experiments, our general conclusion is that the property of benzoquinone of reducing, intensifying and toning silver images is possessed also by the halogenated quinones and by toluquinone. On the other hand, naphthoquinone and anthraquinone do not exhibit these properties. Among the various derivaties of benzoquinone, only toluquinone yields results of practical value, such as can be utilised for the toning of lantern slides, other transparencies on glass and cinema films.

A. and L. Lumière.
A. Seyewetz.

ENLARGEMENTS IN COLOUR.

For the establishment which depends to even a small extent on work for amateurs a line of coloured enlargements has big possibilities, and the present tranquility of business in general provides a good opportunity for launching a campaign of coloured work. The only requirement, over and above those of monochrome work, is the availability of someone with artistic skill, and if such a person is not on the usual staff, it is not difficult to get in touch with an artist who will do the work at home. In no case can the artistic skill be dispensed with, however. It is just as important for even the weakest pictures as it is for a good portrait, if the coloured line is to pay and do good.

There are different methods of colouring photographs, and as to which is best depends largely on one's taste and circumstances, while possibly the artist will be limited to a knowledge of one medium only. When there is no bias and different mediums are equally easy I would advise offering different styles at different prices, but for the best all-round single method I prefer the combination of water-colour and dye which was given in the "B.J." some time ago. This consists of painting practically everything but hands and faces in solid watercolour, and tinting the flesh with dyes. Very convincing results can be obtained in this manner, and from the hands of a good painter such work will have a "quality" appearance. For a cheaper line, dyes alone give very pleasing results, but a disadvantage of the dye method is that it appears too simple and does not always get the care that would be bestowed on opaque colouring. To look really well, dyes need more care, not less, than opaque colours, although a lesser degree of what I might call brush-technique is demanded with the transparent tints. Solid oils should fetch a higher price than water-colours, but personal taste often rules the comparative values of the two.

Unless small contact prints are included in the colouring schedule, coloured work will all be mounted, the tint of the mount being influenced by the quality of the colour. A pure white mount is probably the most suitable for a coloured picture, but mounts of any shade or tint may go with a picture which is not in a definite "tone" of painting. In the case of a monotone picture, the various tints of which are all within a cool or warm range (a seascape, for instance, showing nothing but blues and greens), a more restricted choice of mount is compulsory. A red mount on the seascape would be as upsetting as a green one on a firelit picture.

While it is in order to mount all coloured pictures, or, in other words, to offer nothing but mounted work, it is also easy to include framing or passe-partout, and so increase the monetary value of the work. Gilt is about the most popular thing for coloured pictures, and this can be obtained in passe-partout binding as well as moulding. A window show of well-coloured enlargements on fairly large white mounts in gilt passe-partout, makes a very attractive exhibit.

Whatever prices are decided upon, they should be well above those for similar pictures in monochrome. I recently saw a list on which the prices were over three times the black-and-white figures. As the actual cost of the colouring is not likely to be equal to the list price of the mounted uncoloured enlargement, a good profit was ensured by these figures, and though they seemed high, there was a fair demand. It is obviously possible to turn out good work at lower rates than these, but they must not be too low.

When framing and passe-partout are undertaken, the same principle should be applied. Frames can be bought for a shilling or so, but the making of a high-class frame to order is a different proposition. It does not pay a good firm to connect itself with shoddy stuff. The case is slightly different with passe-partout binding, as it is possible to get really first-class work in this line from the dealers at a very moderate figure, but I know one photgrapher who charges nearly double the usual prices, and does so successfully. My own plan is to double the cost of the materials and add 1s. per

picture: whatever the size, this method of pricing seems to give satisfaction all round.

It is, of course, simple enough to make a good display and offer a complete range of coloured work, without having recourse to framing of any kind, but the frame gives perfection and finality to a display. Framing will follow an order for a coloured enlargement as surely as the purchase of a stamp follows the writing of a letter, therefore it pays both photographer and customer to have the order finished completely at first.—THERMIT.

GERMAN SCIENTIFIC GOODS.

REPORT OF BOARD OF TRADE INQUIRY COMMITTEE.

ON Friday last, December 22, was published the report of the Committee of Inquiry appointed, under the Safeguarding of Industries Act, by the Board of Trade, to hear a "complaint" brought by several trade organisations, among which were the British Photographic Manufacturers' Association and the British Optical Instrument Makers' Association.

The Committee consisted of Sir R. Henry Rew, K.C.B. (Chairman), Mr. A. K. Davies, Mr. Rayner Goddard, Mr. A. E. Holmes and Mr. J. F. Mason, J.P., all of whom sign the report.

The instruction to the Committee was (1) to report whether the conditions specified in Section 2 (1) of the Safeguarding of Industries Act are fulfilled in respect of all or any particular varieties of optical and other scientific instruments. The conditions specified in this Section of the Act (which applies to the prevention of "dumping" into this country) are that the goods are sold or offered for sale at prices below the cost of production; or that by reason of depreciation of currency in the country of origin they are sold here at prices which are below those at which similar goods can be profitably manufactured in the United Kingdom; and that, in consequence of the above, employment in the particular industry in the United Kingdom is being, or is likely to be, seriously affected.

The Committee was also asked to report on the effect of the imposition of a duty under Part II. of the Act, and also was asked to express its opinion on the efficiency and economy with which the goods are manufactured in the United Kingdom.

The proceedings of the Committee were reported in the "British Journal" of May 19, 1922, pp. 298-299; June 9, 1922, pp. 342-343; and June 23, 1922, p. 371.

We print below those portions of the report which relate to cameras and photographic lenses, in addition to the general introduction and to the summary of conclusions. The portions omitted are those relating to microscopes, prism binoculars, ophthalmic lenses, and spectacle frames and eye-glass mountings, and mathematical drawing instruments.

To the

Right Hon STANLEY BALDWIN, M.P.,

President of the Board of Trade.

SIR,

1. By your original minute of appointment, dated 27th April, 1922, this Committee was constituted under Part II. of the Safeguarding of Industries Act, 1921, to inquire into a complaint by the British Optical Instrument Manufacturers' Association, Limited, the British Photographic Manufacturers' Association, the Spectacle Manufacturers' Association, and the Drawing Instrument Manufacturers' Association, that Optical and other Scientific Instruments manufactured in Germany are being sold or offered for sale in the United Kingdom at prices which, by reason of depreciation in the value in relation to sterling of German currency, are below the prices at which similar goods can be profitably manufactured in the United Kingdom, and that by reason thereof employment in the industry manufacturing similar goods in the United Kingdom is being, or is likely to be, seriously affected. We were directed, after ascertaining the facts, to report to the President of the Board of Trade—

(a) whether the conditions specified in Section 2, Sub-section (1) of the Safeguarding of Industries Act, 1921, are fulfilled in respect of all or any particular varieties of Optical and other Scientific Instruments;

(b) on the effect which the imposition of a duty under Part II. of the Act on goods of the class or description covered by the complaint would exert on employment in any other industry being an industry using goods of that class or description as material; and

(c) whether in the opinion of the Committee production in the industry manufacturing similar goods in the United Kingdom is being carried on with reasonable efficiency and economy.

2. The terms of reference to the Committee were published by the Board of Trade in the "London Gazette" of the 28th April, 1922 and it was announced that our first sitting for the taking of evidence would be held on the 15th May, 1922.

3. On the 16th May, 1922, the Board of Trade gave notice that our Terms of Reference were extended to include Optical Elements, whether finished or not, manufactured in Germany, and that the first sitting for the taking of evidence in regard to these additional articles would be held on the 31st May.

4. All the articles to which our inquiry relates (with the exception of spectacle frames and eye-glass mountings), are subject to a duty under Part I. of the Safeguarding of Industries Act, which came into force on 1st October, 1921.

5. The application was opposed by certain Wholesale and Distributing Houses and Export Merchants, and also on behalf of persons engaged in Scientific Research.

6. All the oral evidence was given in public and occupied four sittings of the Committee. In all, twenty witnesses were examined; ten persons, all of whom are concerned in the manufacture of articles to which the inquiry relates, gave evidence in support of the application. The opposition witnesses consisted of the General Secretary of the National Union of Scientific Workers, the Professor and Head of the Department of Chemical Technology at the Imperial College of Science and Technology, the President of the Electrical Wholesalers' Federation, and seven representatives of Importers, Wholesale Houses and Export Merchants. Both sides were represented by Counsel; Sir Arthur Colefax, K.C., and the Hon. R. Stafford Cripps (instructed by Messrs. Vizard, Oldham, Crowder and Cash) appeared for the Applicants, and Mr. T. W. H. Inskip, K.C., M.P., and Mr. Ernest Evans, M.P. (instructed by Messrs. Stikeman and Company) appeared for the Opponents.

7. The oral evidence was supplemented by a large number of specimens of instruments and articles which were handed in by the witnesses and by detailed statements of cost of production and other financial particulars which were supplied confidentially to the Committee.

CAMERAS.

24. No figures were submitted to us of the output of the whole of the camera-manufacturing industry of this country, but the representative of a large English firm of makers stated that at present their output of cameras is on the average about half that of 1913. Account, however, must be taken of the fact that the firm in question normally have a large export trade, and that this has decreased to, at present, about 20 per cent. of the pre-war amount. During the war, this firm, like others in the optical industry, concentrated on the output of apparatus needed for the conduct of the war, 90 per cent. of their plant being employed in the manufacture of special instruments. After the termination of hostilities the trade experienced a boom. The firm mentioned could not meet the demand in 1919; in the year 1920, the output was about three timea larger than at present. The number of employees varied as follows:—

Highest number employed in 1913 ...	845, working 55 hours per week.
Highest number employed in 1920 ...	1,260, working 47 hours per week.
Number employed at present ...	380 (60 per cent. working 47 hours per week and 40 per cent. working 34 hours per week).

The total number of persons employed in the manufacture of photographic apparatus was estimated by one witness at 20,000, but this number was stated to include some 12,000 to 13,000 making sensitised material.

25. A witness for the Applicants informed us that German competition is very severe in the larger forms of camera, especially those used by professional photographers, but the sales of this class of instrument are small; competition is felt most keenly in respect of the small plate camera. He stated, however, that the demand for the plate camera is diminishing, whilst the demand for the roll-film camera is steadily increasing. He added that the most formidable competitors of the British manufacturers imported their cameras from Canada.

26. The sole agent in Great Britain and Ireland of a German manufacturer stated that his firm sold 11 roll-film models for every

From a print on Ilford Bromide Paper ; negative on an Ilford Plate.

ILFORD

Panchromatic Plates are Essential

for many forms of present-day photography. For Expert Work their use opens up new possibilities in Successful Competition.

New paths are opening for a more correct representation of visual values, and those who venture will reap the reward for

Enterprise and Good Work.

These plates are sensitive to all Colours. Their use is fully explained in the Ilford booklet "Panchromatism." Price 6d., post free 9d. in the U.K. or for 4 International Coupons abroad.

ILFORD, LIMITED,

ILFORD, LONDON, ENGLAND.

MATERIALS (continued).

SERVICE.

MISCELLANEOUS.

Barnet Matt-Emulsion Plates.

Self-Screen 300 H. & D.

Super-Speed 550 H. & D.

43, Dover Street,
Piccadilly, London, W.1.

To Messrs. Elliott & Sons, Ltd., Barnet.

Dear Sirs,

The batch of Barnet Super-Speed Matt Plates just received is extremely good. You seem to have conquered the control of the plate, and each batch seems better than the last.

I also appreciate the fine grain; it greatly facilitates the retouching.

Yours faithfully,
MARCUS ADAMS.

Send for particulars.

Manufactured only by
Elliott & Sons, Ltd., Barnet, Herts.

two plate models, and that of the plate cameras approximately half their turnover was in models which British manufacturers do not make. He submitted the following estimate for the whole camera trade of the proportion of supplies from various sources—

Camera sales in Great Britain :—

British make	13 per cent. of the value of the whole.
German make	7 per cent. of the value of the whole (as against 12 per cent pre-war).
Kodak	80 per cent. of the value of the whole.

This takes no account of supplies from other sources, which, however, are small.

27. We are able to supplement the evidence by the following statistics, relating to the imports of cameras from Germany, the United States and Canada, which have been abstracted by the Statistical Department of the Board of Trade from Returns furnished by the Customs. These figures, which do not include the lenses imported with the appliances, are as follows:—

IMPORTATIONS OF CAMERAS INTO THE UNITED KINGDOM.

	From Germany.			From U.S.A.			From Canada.		
	Number.	£	Average Value.	Number.	£	Average Value.	Number.	£	Average Value.
			£ s. d.			£ s. d.			£ s. d.
1920—									
Whole Year	907	1,302	1 8 9	434,388	444,764	0 19 7	—	—	—
1921—									
1st Quarter	1,919	2,348	1 4 6	124,817	128,585	1 0 7	—	—	—
2nd ,, ...	6,203	4,099	0 13 3	100,844	139,741	1 7 9	—	—	—
3rd ,, ...	2,440	4,205	1 14 6	67,431	75,726	1 2 6	—	—	—
4th ,, ...	2,671	1,095	0 8 2	7,269	4,518	0 12 5	2,103	1,375	0 13 1
Whole Year	13,233	11,747	0 17 9	300,361	348,570	1 3 3	2,103	1,375	0 13 1
1922—									
1st Quarter	4,392	2,702	0 12 4	554	886	1 12 0	31,702	11,745	0 7 5
2nd ,, ...	7,237	4,865	0 13 5	527	719	1 7 3	82,169	40,753	0 9 11

28. One of the witnesses attributed the prevalent unemployment in the British photographic industry to (*a*) over-production and over-stocking by dealers in 1920, (*b*) loss of export trade, (*c*) the general trade depression, and (*d*) the failure of British manufacturers to produce popular types of camera. We are unable to determine the relative importance of these various causes, but undoubtedly the camera industry must be regarded as, to a large extent, a luxury trade, dependent upon the general prosperity of the country.

29. The evidence on the subject of the comparative prices in the United Kingdom of similar British and German cameras was conflicting. The value of a camera is largely dependent on the type of lens with which it is fitted, and we found some difficulty in deciding whether articles submitted as similar were, in fact, strictly comparable. Broadly, the Applicants' case, which was mainly founded on the relatively cheap camera and was supported by a number of exhibits, was to the effect that German-made cameras were offered in this country to retailers at prices equal to from 47 to 66 per cent. of those of the equivalent British-made cameras, and that the retail prices varied from about 50 to 75 per cent. of those of the British goods, but there was little evidence of the actual sale of any considerable quantity. They contended, however, that, although the German and British cameras were capable of doing the same work, the German instruments were actually inferior, but that the degree of inferiority was not such as to compensate for the difference in price. Before the war, prices were arranged by agreement between the principal British and German manufacturers.

30. One witness for the Opposition, who contended that, generally speaking, German cameras are not cheaper in this country than similar British-made instruments, gave particulars as to prices which tended to show that especially in the higher-class type of camera the prices of the two makes are about the same. Another witness stated that the prices charged for the cameras of the German firm of which he is the sole agent in Great Britain were based on those of the Kodak cameras, and as these form so large a proportion of the total supply they must have a considerable influence on the prices of competing firms.

31. As we have pointed out, the number of cameras imported from Germany is only a small proportion of the total trade of the United Kingdom, and after reviewing the evidence, we have arrived at the conclusion that it is insufficient to show that they are being generally sold in the United Kingdom at a price lower than that at which they can be profitably manufactured in this country.

PHOTOGRAPHIC LENSES.

32. A very large proportion of photographic lenses being used in the manufacture of cameras, any falling-off in the sales of cameras is reflected in unemployment in the photographic lens industry. We have been supplied with certain incomplete statistics which show a decrease in the number of employees engaged by four different firms on the manufacture of lenses.

33. It was stated by one witness that Messrs. Zeiss fixed their prices at approximately 20 per cent. below those charged by his firm, this cut being, he suggested, what they considered was necessary to get the business. On the other hand, evidence was adduced by the Opposition which indicated that the list or retail prices of lenses of certain German manufacturers, although generally lower than those charged by his firm, were in very few instances lower than the prices of similar lenses of four other British firms. The witness in support of the Application contended, however, that German-made lenses are sold in this country below the prices at which they are listed by the German firms' accredited British agents, although he expressed the opinion that the agents themselves charged list prices for the lenses and that they were endeavouring to frustrate "back-door methods" of importation. We were informed by the Opponents that English camera manufacturers had agreed not to list German lenses.

34. After considering the evidence, we are of opinion that the Applicants have failed to justify the allegation that photographic lenses manufactured in Germany are sold in the United Kingdom at prices below those at which similar goods can be profitably manufactured in this country.

SUMMARY OF CONCLUSIONS.

51. Before summarising our conclusions, we think it right to draw attention to the fact that the value of the German mark in relation to the £ sterling has fallen from 1,400-1,470 on June 19* to 2,300-2,350 on July 27. It would not, however, be practicable to take this fact into account without reopening the whole inquiry. Our conclusions are as follows:—

(1) No evidence was submitted regarding the cost of production in Germany of any of the articles with which we are concerned, and we are, therefore, not in a position to express an opinion on the question whether they are being sold or offered for sale in the United Kingdom at prices below the

* The date on which the Committee concluded their public examination of witnesses.

cost of production as defined in Section 8 of the Safeguarding of Industries Act, 1921.

(2) The evidence placed before us in regard to microscopes, prism binoculars, cameras, photographic lenses and ophthalmic lenses is insufficient to convince us that such articles manufactured in Germany are being sold or offered for sale generally or on a commercial scale in the United Kingdom at prices below those at which similar goods can be profitably manufactured in this country.

(3) We are of the opinion that (*a*) metal spectacle frames and eyeglass mountings, and (*b*) mathematical drawing instruments, manufactured in Germany, are being sold or offered for sale in this country at prices which, by reason of depreciation in the value in relation to sterling of German currency, are below those at which similar goods can be profitably manufactured in the United Kingdom. We consider further, that, by reason thereof, employment in these industries is being or is likely to be seriously affected.

We are of opinion that the imposition of a duty on these articles would exert only a negligible influence on employment in any other industry using them as material, and also that the industries manufacturing these goods in this country are carried on with reasonable efficiency and economy.

(4) No evidence was offered to enable us to express any opinion on the question whether the conditions specified in Section 2, Sub-section (1) of the Safeguarding of Industries Act, 1921, are fulfilled in respect of any optical elements or optical or scientific instruments other than those we have specifically dealt with.

We wish to express our indebtedness to our Secretary, Mr. T. Turner, for the valuable assistance he has rendered us during the whole of our proceedings and in the preparation of this Report.

We have the honour to be,

Sir,

Your obedient Servants,

R. Henry Rew (Chairman).
Arthur K. Davies.
Rayner Goddard.
A. E. Holmes.
James Francis Mason.

T. Turner (Secretary),
August 3, 1922.

The full report has been published by His Majesty's Stationery Office, price 9d. net, and is purchasable through any bookseller, or directly from H.M. Stationery Office at the following addresses: Imperial House, Kingsway, London, W.C.2, and 28, Abingdon Street, London, S.W.1; 37, Peter Street, Manchester; 1, St. Andrew's Crescent, Cardiff; or 23, Forth Street, Edinburgh.

Assistants' Notes.

Notes by and for assistants will be considered for this column. Payment for accepted contributions is made on the first of the month following publication.

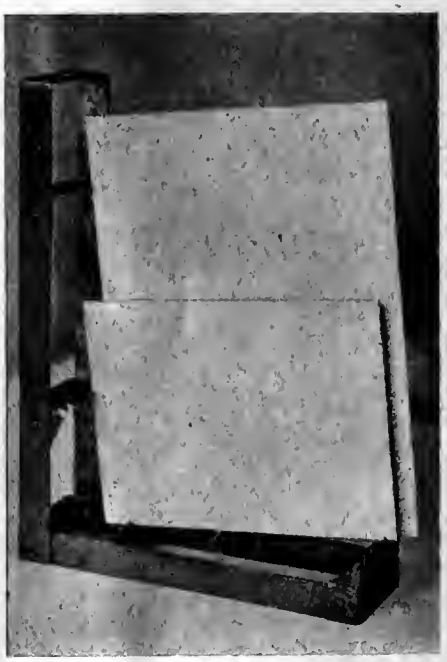
Cleaning Originals before Copying.

Many of the original prints received for copying would yield better results if they were cleaned before being pinned upon the easel. This must not be done indiscriminately, however, as what may freshen up one photograph may utterly ruin another. A Daguerrotype, for instance, will hardly stand brushing with the softest of camel-hair, while a collodion positive (often confused with the above-mentioned), if uncoloured, may be washed with water and a tuft of cotton-wool. These also may be revarnished to advantage, but a hot varnish must be employed, a cold celluloid varnish being quite unsuitable. Some cold varnishes are liable to dissolve the collodion, and with this the picture. Many of the "tin-types" brought in to be copied are coated with gelatine, and will stand a fresh fixing in hypo, followed by the usual washing and drying. A coat of varnish upon these will often remove the scratchy surface caused by rubbing. As regards prints, a collodion print must not be cleaned with spirit, but with plain water, which, however, may remove any spotting that has been done upon it. A platinum print may be rubbed over with very soft rubber or with bread if there is much dirt to remove, but the handling must be patient and gentle, and the print quite dry. Gelatine and albumen papers may be cleaned with water, with the risk of removing any hand-work, but methylated spirit, often advised, seems liable to make a dirty solution that soaks into cracks, especially into the edge of the print where it joins the mount.

Where hand work has been done upon prints of all kinds, a very safe thing to use for cleaning is good motor spirit or benzine. This will not affect any touches of water-colour, but will most certainly remove pencil-work. For any kind of print which bears pencil drawing it seems impossible to do anything more than brush off any loose dust.—C. M. K.

A Novel Plate Rack.

The plate-rack illustrated was made partly as an experiment to discover whether certain ideas would be practicable, and, secondly, in order to make use of a set of deep but narrow stoneware tanks that came into my possession. The result of the experiments proved perfectly satisfactory, and there is no reason why the principle of this rack should not be adopted with entire success. Wooden racks for tank use are not particularly easy to load, especially with panchromatics in the dark, and they displace a large volume of water, so that a roomy tank is needed, or care must be taken to use the right bulk of solution. Moreover, if a wooden rack is not filled up it tends to float and lift plates above the solutions at one end or corner. Metal racks, which have the grooves nearer together than wooden ones, are liable to corrosion and chemical action, which may affect the plates. The aim of the rack shown is first of all to hold the plate firmly at as few points as possible, so as to allow solutions in developing and fixing, water in washing, and air in drying, to circulate with a minimum of obstruction. It succeeds in doing this by supporting the back and edge of the plate at three points



only, a slight tilt preventing any tendency to slip out. The film side is not touched at all. This is achieved by having the teeth of the racks perpendicular on the right-hand side, and slanting away on the other side, so that by putting plates in with films to the left they drop into the notches until the glass comes up against a straight side.

That there is no particular difficulty in loading up I proved by taking the rack, as soon as I received the first model, into the dark-room with a packet of spoilt plates and loading up in absolute darkness. With no previous trial the operation was as quick and accurate as with any other kind I have used. Also the plate will not easily drop out, as I have repeatedly demonstrated by swinging a rackful about quite happily, and it may also be noted that the same rack will accommodate more than one size of plate.

By means of a small hole in the top bar the rack can be hung upon a hook screwed into the wall. Drying of negatives thus takes place evenly and rapidly, while they are out of harm's way and require no shelf-room.—D. Charles.

FORTHCOMING EXHIBITIONS.

December 9 to 31.—Rochdale Amateur Photographic Society. Particulars from the Hon. Secretary, W. Lord, 10, Derwent Street, Rochdale.

1923.

February 5 to March 3.—Northern Photographic Exhibition. City Art Gallery, Manchester. Latest date for entries, January 12. Particulars from the Hon. Exhibition Secretary, Walter Johnson, 30, Hartington Road, Chorlton-cum-Hardy, Manchester.

February 10 to 24.—Scottish Photographic Salon. Particulars from the Secretary, George A. Ross, Northfield Cottage, Brechin.

February 12 to 14.—City of London and Cripplegate Photographic Society. Latest date for entries, January 29. Particulars from the Hon. Secretary, J. J. Butler, 7, Gresham Street, London, E.C.2.

February 14 to 17.—Horsham and District Camera Club. Latest date for entry forms, February 3; exhibits, February 7. Particulars from the Hon. Secretary, S. Mitchell, 33, Bedford Road, Horsham, Sussex.

March 1 to 8.—Birmingham Photographic Society. Latest date for entries, February 15. Particulars from the Hon. Secretary, J. E. Breeze, 178, Broad Street, Birmingham.

March 2 to 31.—Pittsburgh Salon of Photography. Latest date, February 5. Secretary, Charles K. Archer, 1,412 Carnegie Building, Pittsburgh, Pa., U.S.A.

March 13 to 16.—Exeter and West of England Photographic Exhibition. Particulars from the Hon. Secretary, R. W. J. Norton, 4, Buddle Park, St. Thomas, Exeter.

March 17 to 26.—Welsh Salon of Photography. Latest date for entries, March 10. Particulars from the Hon. Secretary, H. G. Daniel, 154, Penylan Road, Cardiff.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications December 11 to 16 :-

CAMERA DEVICE.—No. 33,887. Devices for determining distance from lens to plate, etc., in cameras. K. G. Hagstrom and A. J. Ostlind.

REFLEX CAMERAS.—No. 34,026. Reflex cameras. R. G. Matthews.

PICTURE TRANSMISSION.—No. 34,181. Method of transmitting pictures to a distance. Picturadio Corporation.

CINEMATOGRAPHY.—No. 34,221. Production, projection and viewing of cinematograph, etc., pictures. W. J. Haydock.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 1/- each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

CAMERA FOR WHILE-YOU-WAIT POSTCARDS.—No. 182,117 (June 22, 1921). The specification describes certain improvements in the photographic apparatus, described in specification No. 166,524 ("B. J.," 1922, November 17, p. 699-670). The red observation glasses or a joint glass for the two observation apertures are lifted by the action of a spring and fixed in the removed position so that, on the door being closed, they are released and automatically returned to the closed position. The wall of the box, on which the carrier and the focussing screen are mounted, may be rotated together with the carrier frame and focussing screen, and the objective frame connected to the copying frame support by removable bellows.—Wilhelm Feuerzeug, 30, Briggittenauerlände Vienna XX., Austria.

The following complete specifications are open to public inspection before acceptance :—

TRIPOD HEADS.—Heads for camera tripods and like apparatus. J. Mery.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, JANUARY 1, 1923.

Bradford Photographic Society. Whist Drive and Dance.
Forest Hill and Sydenham P.S. 1921 R.P.S. Competition Prints on view.
Walsall Phot. Soc. "Paget Colour Slides." Paget Prize Plate Co.

TUESDAY, JANUARY 2.

Royal Photographic Society. "The Lamplough Flash Lamp." H. Lamplough. "Demonstration of German Aeroplane Camera." A. C. Banfield.
Bournemouth Camera Club. Competition. Prints made from negatives taken on Club Rambles.
Cambridge and District P.S. "'Ilford' Lantern Plates." A. Brooker.
Exeter Camera Club Exhibition of 1922. R.P.S. Affiliation Competition Slides.
Hackney P.S. "Modern Negative Making." Kodak Co.
Maidstone and District P.S. "Bromoil." H. W. Witcombe.
Manchester Amateur P.S. "Across France to the Pyrenees." W. Butcher & Sons, Ltd.
Morley Amateur P.S. Members' Evening. Social and Supper.
Portsmouth Camera Club. "The Exhibition Picture." Eng.-Cmdr. E. J. Mowlam.

WEDNESDAY, JANUARY 3.

Bristol Photographic Club. Musical Evening.
Croydon Camera Club. "Reminiscences of a Summer Holiday in the Swiss Alps." C. Keifer.
Leighton Buzzard and District C.C. "The Romantic in Landscape." R.P.S. Lecture.
South Suburban and Catford Phot. Socs. "Rambles in Palestine." F. R. Salmon.
The Photomicrographic Society. Members' Evening.
Wolverhampton Phot. Soc. "Landscape Photography." H. Rushton.

THURSDAY, JANUARY 4.

Edge Hill Camera Club. Social Evening.
Hammersmith Hampshire House P.S. "London Seen through the eyes of Hogarth." A. H. Blake.
Kodak Staff P.S. "Off the Beaten Track at the Zoo." J. E. Saunders.
Liverpool Amateur P. Assoc. Lecturettes by Members.
Richmond Camera Club. "Shutters and Shutter Testing." T. Smith.
Sunderland Phot. Assoc. "Transferotype." R. Chalmers.
The Camera Club (London). "The Evolution of the Lantern Slide." W. L. F. Wastell.

CROYDON CAMERA CLUB.

Mr. J. M. Sellors resumed and concluded his "Common-sense Exposure System, for bromide papers, lantern-slides, etc." Yielding to the persuasion of a member, who pointed out that in fairness the club should not alone be afflicted, the learned honorary secretary has graciously promised to prepare a description of the system and slide-rule, which doubtless will appear in the "B. J." in due course.

Practically the same system (since improved) was demonstrated by him over nine years ago, and he was then subjected to a very severe test. Three negatives not previously seen by him and three sheets of bromide paper of different brands were handed him by doubting members. Based on density-meter readings of the negative, and estimation of the speed of the papers under a step-wedge, three enlargements were made. They proved to be technically perfect, and the pronounced sniffers present had to abate their nasal intake.

Mr. Sellors said that he had found a range of speeds in present-day bromide papers in ratio 1 to 63, and different batches of the same brand often varied widely. If any sensible person wants to know the time he consults a watch or a clock, he continued. Why not, therefore, adopt almost as simple a procedure for finding the correct time for an enlargement.

An analogy might be drawn between the curves of plate densities and human tendencies. The period of inertia (=0) was represented by the teetotaller. A happy mean by the moderate drinker, full of beans and bounce, equivalent to a gamma of 1. Over-exposure and over-indulgence induced a flattening of tones and ideas respectively, whilst reversal was represented by the gentleman

in the gutter. At this juncture the "office boy," alleging a gamma of only 0.25, demanded and obtained the usual interval.

This brightened things up a bit. Mr. Wadham had come to the conclusion that if the density-meter were furnished with a powerful spring and easy release it would form a rat trap of real utility. The question of stained negatives then arose, and Mr. Jobling suggested standardising their densities by means of a Wynne actinometer in conjunction with the rat trap. Mr. Purkis said that readings should be made through blue glass, but on thinking the matter over, at the not unduly polite request of Mr. Salt, said no more on this point. He deplored that the average amateur, who often took infinite pains in other directions, took no steps to become familiar with the A B C of Messrs. Hurter and Driffield's investigations.

Mr. Ackroyd mentioned he had tried the system advocated for lantern-slides. Previously, on an average, he had only obtained two good slides out of a dozen plates, but since adopting it these numbers had been reversed. "To secure twelve good lantern-slides from two plates is indeed a feat," commented Mr. Salt. Mr. Ackroyd, somewhat short in manner, explained that ten good slides out of a dozen was meant.

Standard illuminants within the reach of the ordinary amateur were next considerd. It was agreed that an electric bulb run off the main was a ludicrous solution of the problem. In the same category were bats-wing burners, now the cash-consuming thermal-units are in force. Better, an incandescent gas burner or acetelyne jet. The two latter, Mr. Purkis pointed out, should always have a screen in front perforated with an aperture small in comparison with the area of the flame. Mr. Hibbert followed with a general eulogy of the lecture. Recognition, he thought, ought to be made for the enormous amount of labour it must have involved. Someone suggested "passing round the hat," but a hearty vote of thanks was accorded instead.

Commercial & Legal Intelligence.

Copyright Infringement by Authorizing.—In the King's Bench Division of the High Court, on December 19, before Mr. Justice Rowlatt, the action of the Performing Rights Society, Ltd., against the Ciryl Theatrical Syndicate, Ltd., and P. M. Faraday, was heard. As reported in the "Times," the plaintiffs in this action were the proprietors of the right of performing in public a large number of musical works, and the defendants carried on business as producers of plays at the Duke of York's Theatre, W.C. The claim was for damages and an injunction in respect of the infringement by the defendants of the plaintiffs' copyright in works known as "Mary" selection and "Colonel Bogey" march, which had been performed at the Duke of York's Theatre in July, 1921, without the consent of the plaintiffs.

In delivering judgment, Mr. Justice Rowlatt said:—In this case I want to say a few words about the Copyright Act, 1911. By section 1 (2) the rights included in the word "copyright" are enumerated, and one of these rights is to authorize the performance. That is to say that one of the rights protected is the mere authorizing as opposed to the authorizing followed by acting upon the authority. Secondly, authorizing does not mean giving power to an agent. Authority can be given to a person to act without such person being an agent. Thirdly, I do not think the word "authorize," has any relation at all to the character which the person giving the authority bears. If a person authorizes a thing to be done, it is not to be said he does not do it because he is acting as agent for somebody else. In making a contract, a person who acts as agent is not a contractor because his principal is the contractor. But in authorizing a thing to be done, a person does it himself, although he may be only acting as agent for someone else.

Section 2 (1) deals with infringements, and it makes a person an infringer who does any act which the proprietor of the copyright alone has the right to do. It makes an infringement the doing of anything which comes within the meaning of the word "authorize," which I have just explained. In this case the defendant syndicate were the lessees of the theatre and the defendant Faraday their managing director. Mr. Faraday engaged Mr. Bobbé when the theatre was taken over by the syndicate. In the course of performing, Mr. Bobbé—who selected the music—infringed the plaintiffs' copyright. Mr. Faraday could have prevented that. He had power to prevent Mr. Bobbé playing any particular piece and he had power to dismiss Mr. Bobbé. If Mr. Faraday, as managing director, allowed the performance, he authorized it. Mr. Faraday wrote that he did not care what was played, and if, in consequence of that, music was played which was an infringement of copyright, it rested upon him alone. There was ample evidence that Mr. Faraday authorized these infringements, and there must be judgment against him and also against the defendant syndicate. Plaintiffs are entitled to an injunction, and therefore there will be judgment for the plaintiffs with an injunction and costs, and they may take out, as damages, the £10 paid into Court.

News and Notes.

Panoram Kodaks.—A new booklet has just been issued by the Kodak Co., containing particulars and instructions for use of the Nos. 1 and 4 Panoram Kodak cameras, making pictures 7 by 2¼ in. and 12 by 3¼ in. respectively.

Held Over.—Owing to the fact that the present issue has been clased for press several days earlier than usual, by reason of the Christmas holidays, a number of notes, answers to question, etc., are unavoidably held over until the first issue in the New Year.

Welsh Salon of Photography.—The Wales and Monmouthshire Photographic Federation will hold the Welsh Salon of Photography at Cardiff from March 17 to 26. The last day for entries will be March 10. Entry forms and prospectus are obtainable from Mr. H. G. Daniel, 154, Penylan Road, Cardiff.

Reduction in Lens Prices.—Messrs. Aldis Brothers, of Sare Hole Road, Sparkhill, Birmingham, the makers of the well-known Aldis lenses, inform us that on and from January 1 they are making a substantial reduction in their list prices, approximately 25 per cent. A small temporary list, embodying the new prices, has been prepared and may be obtained upon application to Messrs. Aldis.

Nature Photographs as Christmas Cards. — Handsome cards, which made capital Christmas cards for nature lovers, were produced by the authorities at the Natural History Museum, South Kensington. They consisted of excellent photographs of the wonderful groups in the Bird Gallery, as well as of the mammals and even the insects. We are told that on some days a queue of people were buying them at 1½d. each.

Horsham Camera Club.—The first annual exhibition arranged by this club will be held in the Town Hall, Horsham, for one day, February 14 next, and at the club premises from February 15 to 17. There are five open classes, in addition to others for members only. Mr. C. P. Crowther, who will judge, will have silver and bronze medals at his disposal. Prospectus from the hon. secretary, Mr. S. Mitchell, 33, Bedford Road, Horsham, Sussex.

Photographs by Wireless.—It is stated that a photograph has been sent by wireless from Rome, Italy, to Bar Harbor, Me., and thence by mail to New York City, in less than 24 hours' time. The apparatus used was of the type originally developed by Dr. Arthur Korn, of Berlin, for telegraphic reproduction of pictures. He now has a laboratory in the Italian city, and has been co-operating with the U.S. Navy radio station at Otter Cliffs, near Bar Harbor.

London Camera Club.—We hear that it is the intention of the London Camera Club to resume the publication of a monthly journal of its proceedings, a policy which obtained for a while some years ago under the present organisation at John Street, Adelphi, London, W.C.2. The step will be welcomed, particularly if verbatim notes of lectures or communications of technical interest can be published in its pages. The files of the original series of the journal, issued when the Camera Club was in the Charing Cross Road, are a storehouse of many important papers by Abney, Hurter, and Driffield, and others.

Eaton School of Photo-Engraving.—The school conducted at Effingham, Ill., United States, by Mr. E. R. Eaton, a former instructor at the Bissell College of Photo-Engraving, has issued a prospectus of its courses of practical instruction in line and half-tone negative making for letterpress, photo-litho and offset printing. No mention is made in the prospectus of instruction in printing and etching. It seems difficult to understand that a course of training which does not include these parts of the process can

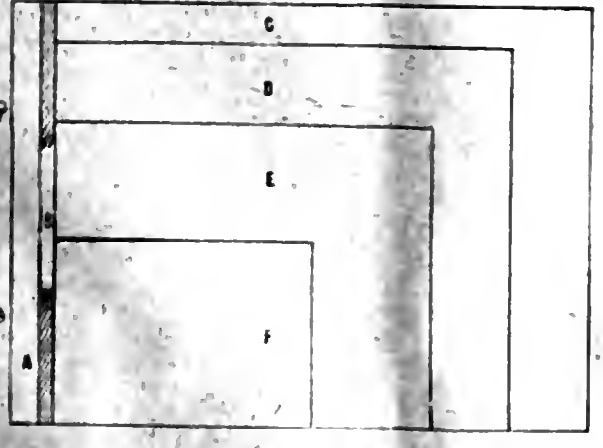
have any great value for students intending to make use of their skill commercially.

RETIREMENT OF MR. J. B. PAYNE.—A member of the photographic industry, who is among the oldest in point of long association with it, is retiring at the end of the present year in the person of Mr. John Buxton Payne, for many years managing director of the old-established firm of Mawson & Swan, Ltd., Newcastle-on-Tyne. In token of his long services to the company the shareholders of Messrs. Mawson & Swan, recently made a presentation to him of a silver rose bowl, appropriately of the local Tyne design. Everyone who has known Mr. Payne and has realised the activity of his long business life will wish him every leisure and enjoyment in his retirement. He will be succeeded by his son, Mr. Arthur Payne,

MR. JOHN BUXTON PAYNE.

who has been connected with the business on both the technical and commercial sides for many years, and who is well-known to the general body of photographers by his writings and experimental work, chiefly in orthochromatic photography. Under Mr. Arthur Payne's management and with the advantage of his father's advisory aid as chairman of the company, there can be no doubt that the business of Mawson & Swan will continue to be carried on upon the lines which have merited respect for so long a period of time.

STANDARD ALBUM SIZES FOR COMMERCIAL PHOTOGRAPHS.—The Commercial Photographers' Association of Chicago have adopted a standard size of mount for photographs, which are intended for binding into albums. The mounts are attached to a strip of card, of the same material as the mount itself, by a hinge of cloth. Holes are pierced through the strip with a 3/16th inch standard



punch, and the positions of such holes are altered to suit the different sizes of mounts. The holes should be punched in such a position that a distance of $\frac{1}{8}$th inch is allowed between the back edge of the strip and the centre of the hole.

We publish herewith an illustration of the standard chart supplied by the Association, together with the measurements, as they appear in the current issue of the "Bulletin of Photography."

A is the $\frac{3}{4}$-in. strip of card which is attached by the cloth hinge to B, $\frac{1}{4}$-in. wide, to the mounts. The holes for the plugs of the loose leaf binder are shown outside the strip, but these, of course, are punched through the strip as required. The centres of these holes are shown, and measurements are made from these. The largest mount, C, is $10\frac{3}{4}$ in. by $13\frac{3}{4}$ in., and the holes are punched 6 in. from centre to centre. Mount D measures $9\frac{3}{4}$ in. by $11\frac{3}{4}$ in., and the holes may still be 6 in. apart. In mount E, the measurements are $7\frac{3}{4}$ in. by $9\frac{3}{4}$ in., and the holes $4\frac{1}{2}$ in. from centre to centre, while the smallest mount, F, measures $4\frac{3}{4}$ in. by $6\frac{3}{4}$ in., and the holes are $3\frac{1}{2}$ in. apart.

MIDLAND COUNTIES FEDERATION.—Its year book for 1923 has been issued by the Midland Counties Photographic Federation. It contains lists of officers and federated societies, and a directory of the lecturers within the membership of the Federation who voluntarily offer their services. Their names and the titles of their subjects show the valuable help which the Federation can render through them to society secretaries in the preparation of attractive programmes. Further particulars of the Federation are obtainable from the Hon. Secretary, Mr. J. S. Lancaster, 9, Middleton Hall Road, King's Norton, Birmingham.

THE "KODAK MAGAZINE."—A copy of the first issue of the "Kodak Magazine," to which we recently referred, has reached our table. It is an attractive and well-illustrated 16-page periodical, with contents appropriate to the season. Mr. and Mrs. Cadby write of winter sports' photography. There is a paper on flashlight, including its use for making silhouette portraits. The fascination of night photography is underlined by a reproduction of a photograph of the Scott Memorial at dusk, illustrating an article on the pictorial wealth of Edinburgh. Mr. J. E. Saunders, noted for his photographs of animals in the Zoo, contributes the first of a series of chapters on "Photography with a Purpose." Practical notes, such as those on the use of a tripod and on fixing, have their place, and elements of art and humour theirs also. The little magazine will be certain to make friends for itself among the innumerable users of Kodak cameras. It is sold by Kodak dealers and at Kodak branches, price 2d.

Correspondence.

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

*** *No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

WHAT IS PICTORIALISM?

To the Editors.

Gentlemen,—I shall not "come on" to the slightest degree more than necessary. I have neither friend Evans's evident leisure, nor his mercurial energy. Suffice it to say that I never denied taste in selection of subject to Mr. Evans; and if he maintains that such taste constitutes creative art, as he calls it, I'm quite agreeable. It is, however, wrong to assume that the only alternative to over-exposure for shadows is "empty blackness." I assigned the difference between the works of White and those of Evans to printing and to negative-making facilities. Mr. Evans pushes these facilities as far as they will go, which is far beyond the limit of White; and of Velazquez. Farther still, Velazquez does *not* give detail in shadows. Mr. Evans had better have another look. It is amazing to me that he can couple his photographs (in this connection) with the works of Turner and Bosboom. It shows the hopelessness of argument, and explains his query, "What is Pictorialism?" No one can answer this in words; and, perhaps, only painters thoroughly know, because it is an intuitive perception, not a thing to understand by definition. "Waiting" and "studying every hour" will not give more than an almost inconsiderable factor in it. What Mr. Evans says about his tomb print supports my contention. One does not make a "picture" of carvings on a tomb.

I fancied I had done these Westminster prints full and generous justice. But Mr. Evans never was content with "all the toys"; he will have the "big doll" too.

Yours faithfully, F. C. TILNEY.

Answers to Correspondents.

In accordance with our present practice a relatively small space is allotted in each issue to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

E. T.—(1) Yes, but you will require a further diffusing medium in the shape of a sheet of flashed opal, placed near to the lamp. This may be obtained from Messrs. James Hetley & Co., 35, Soho Square, London, W.1. (2) The amount of enlargement is certainly great for an apparatus of this type, and we fear the exposure would be rather excessive with a lens of only *f*/8 aperture.

S. K.—We advise, first of all, copying the print as it stands. Then having obtained a passable negative, you may try and remedy the present print. Soak the print in water for about one hour and then place it in the following solution: Alum (saturated solution), 10 ozs.; hydrochloric acid, 3 drs. The print should be carefully watched in this solution and removed from time to time to a dish of clear water.

W. P.—Photograph the wording (from print, preferably) upon a thin celluloid Process film. This will give you clear letters on a black ground, which may be used for printing upon your cards. If you have arranged the words in the position they will occupy upon the postcards the wording negative may be used to print after the card has been exposed. If you require the wording to print with each negative, remove a portion of the film from the bottom of the picture negative and place the name strip in this position when printing.

M. S.—Coat the glass side of your negative with matt varnish in which has been dissolved a flake or two of iodine. When dry, scrape away the varnish covering the part of the machine you wish to show. The background in the whole negative should now be painted over with "Photopake," taking care that the outline does not cover any small detail of the machine. You will thus get a faint printing of the parts of the machine which are not essential to the illustration, while the essential part will show strongly against a white background.

V. R. T.—The film may be removed by soaking the negative in the following solution:—

Methylated spirit	1 oz.
Water	2 ozs.
Hydrofluoric acid	60 minims.

When the film appears to be leaving the glass at the edges it should be rolled up by aid of the finger, keeping the film all the while under the solution. When quite free from the glass the film should be washed for five minutes in running water and then placed upon its final support.

W. H. V.—We should suggest the Barkay reflector with a 3,000-c.p. lamp, and on the other side of the studio a 2,000-c.p. lamp, as you suggest. By this means you would have a good amount of light, but for the photography of children another lamp of about 3,000-c.p. would be necessary, to be used only as required. You would then be able to obtain well-exposed pictures and be sure of your results. It is rather difficult to advise you in reference to the lens, as price enters rather largely into the question, but for preference we should obtain either a Cooke Series II. portrait, or a Dallmeyer Series A or B portrait.

A. G.—A formula for a combined developer and fixer to produce black and white results is as follows:—

Water, to make	40 ozs. fluid.
Hydroquinone	½ oz.
Soda sulphite	4 ozs.
Soda carbonate	4 ozs.
Hypo	8 ozs.
Liq. ammonia .880	2 fl. ozs.

Addition of more ammonia to the developer gives more vigour. The plates develope (and partly fix) in two or three minutes. They can then be examined in daylight and fixed in plain hypo.

REFLECTOR.—Your studio should prove quite large enough for moderate groups, but you will require more light. The two 3,000-c.p. lamps on the right-hand side should be augmented by one other of 3,000 c.p. placed in the position marked, while on the other side you require two lamps of the same candle power. You could increase the light still further by using the Barkay reflector. A spot light should be extremely handy; indeed, we think the general utility of such a lamp demands its use in the studio where special lighting effects are attempted, as the light may be concentrated over areas extending from about 10 inches to many feet.

H. C.—The usual method for reducing the intensity of a background in a subject such as that of the machine which you send is to coat the back of the negative with a matt varnish and to scrape away this latter from the parts over the foreground portion of the subject. If still greater reduction of the background is required, a very little yellow dye may be added to the varnish. In fact, a usual way of colouring the varnish for this purpose is to dissolve in it a flake or two of iodine. You can get a suitable ground glass varnish from, say, the Vanguard Manufacturing Co., Maidenhead, and from this same firm you can also get a preparation known as "Billdup," which can be used in a somewhat different way. It gives a clear coat on the glass side of the negative, which then can be worked up with a stump and powder for reduction of the background. But for your special purpose the ground glass varnish method is the better.

O. S. R.—(1) The curtains should be loose enough to run freely on the wires. A sag of 3 inches in the middle is enough. (2) If the sitter is brought well forward away from the background the back lighting will give little trouble, screens or backgrounds may be arranged so as to intercept as much as possible. (3) We do not think the 4 curtains enough to cover 10 ft. of glass, five black ones would be better. There is really no need for so many white blinds, three would be ample. (4 and 5) About 10,000 c.p. distributed in such a way as you may choose, say four 2,000 c.p. and two 1,000 c.p. You would not need always to use the full number, but it makes the lighting simpler to have a reserve of power. The lamps may be arranged in a curve or L-shape, the front ones being about 8 ft. high and about 6 ft. from the background, the side ones and that at the angle of the L should be lower, say 6 ft. If possible all lamps should be made to raise and lower. (6) Choose a small sized panelling, each panel say 12 inches wide and 15 to 18 inches high. Medium dark shade, not "antique" colour. (7) The lens is excellent value for the money, and is quite suitable for portrait work; the field is not as flat as those of the more expensive types. (8) We know of nothing more satisfactory than the cylindrical oil heaters. If these are kept clean they are practically odourless. (9) There is no way of economising current while focussing except by switching off some of the lamps. For effective control of the lighting each lamp should have a separate switch.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. **PRICE FOURPENCE.**

TERMS OF SUBSCRIPTION POST FREE.

UNITED KINGDOM OR CANADA.—*One Year*, £1 1s. 8d.; *Six Months*, 10s. 10d.; *Three Months*, 5s. 5d.

ANY OTHER PART OF THE WORLD. *One Year* ..... £1 3s. 10d. *Six Months* ... 12s. 0d. *Three Months* 6s. 0d.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibits the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers. 24, Wellington Street, London, W.C.2.

No 182. VOL. XVI. JANUARY 6, 1922.

THE BRITISH JOURNAL OF PHOTOGRAPHY

MONTHLY SUPPLEMENT

ON

Colour Photography.

CONTENTS.

RAYDEX THREE-COLOUR PRINTING.

To anyone who has not himself experimented with three-colour photography the process described in detail appears intricate and full of difficulties, but in actual practice these intricacies and obstacles disappear, and, given reasonable care, once the original negatives are made the procedure is as simple as any other. No special apparatus is needed except that the camera must be adapted for plates, that the slides move easily in their guides, and above all that the apparatus is steady and firm, for the slightest movement during the taking of the three negatives is fatal to success. In addition to the camera, three-colour filters—red, green and blue—are required, and it is most advisable to procure a set of these from the start, as such a set is tested before leaving the factory to fulfil the following requirements:—

(1) Give the same sized image.

(2) Be of identical thickness. These filters are made of suitably dyed gelatine films, and may be used either unprotected or cemented between glass; if the bare films be employed they may be placed in front of the lens, taking care not to damage them by finger marks—to which the film is very susceptible. If they are cemented between glass the latter must be of the very finest quality and optically worked to enable them to be used in front of the lens; if used behind, thin plate glass will suffice. In the third alternative position—i.e., placed immediately in front of the plates, as in a repeating back—the quality of the glass is immaterial.

In outline the process is as follows:—

(1) Three negatives are made, each through one of the filters referred to.

(2) Three bromide prints from these are made.

(3) Three-colour positives are made from the bromides on yellow, red, and blue tissue, and subsequently by means of transparent supports superimposed in exact register on a final paper base.

We will take first the making of the negatives. It is best to experiment with still life subjects which can be taken indoors, thus doing away with any difficulties arising from movement due to wind—flowers, fruit or butterflies make admirable trial subjects, the more brightly and sharply defined the colours the better, as this makes the process the easier to follow. The trouble concerning wind in outdoor work to which I have referred is, of course, the waving of branches, trees, etc.; in an ordinary monochrome reproduction this is irritating, but it is even more so in three-colour work, as it will give rise to colour fringes.

A method of obviating this is to practice counting seconds and half seconds without reference to a watch—being thus enabled to keep an eye on the subject while the exposure is being made, as soon as a breeze springs up and movement seems imminent the shutter may be closed and reopened when all is still again. The moment of opening should be reckoned as 0, not 1, and if it is found necessary to close the shutter when, say, 3 has been counted the time of re-opening should be the same as that counted on closing.

We will suppose that it has been decided to make the first attempt on a butterfly. Having pinned the subject on the easel and sharply focussed, the next step is to ascertain the correct exposure by the aid of a meter. A very full exposure is necessary, two or even four times that indicated by the reading being not excessive. We will suppose that using *f*/8. the meter indicates ¼ sec., and we decide to give a normal exposure of 1 sec. The next step is to find out the multiplying factors for the filters in use. Presuming we are using Wratten tricolour filters and Wratten Panchromatic plates we shall find the necessary factors on the card accompanying the latter—we will say that these factors are:—Red 7, green 10, blue 6, then we shall have to give 7 secs., 10 secs., and 6 secs. respectively. (By the way, it is always advisable to number the plates 1, 2 and 3 when filling the slides, and always to work in the same order—red, green, blue or blue, green, red, to obviate any subsequent difficulty in identifying the negatives.) Backed plates should always be used. Inserting the red filter in the holder, the negative numbered 1 is exposed for 7 secs.; reversing or changing the slide, as the case may be, and altering the filter to green; No. 2 is exposed for 10 secs., and finally, No. 3 is exposed through the blue filter for 6 secs. Care must be taken in using the filters to see that they are always placed in position the same way; there are small labels on each Wratten filter, and by means of the lettering on these this is quite easy of accomplishment. Another point is that great care must be taken not to jar or move the camera in any way while removing old or inserting new slides.

Having given the plates identical relative exposures the next procedure is to give them identical development—in fact, from this stage, whether we are dealing with plates, bromide prints, or colour positives all must have exactly the same treatment to ensure uniformity of the final result. To this end, then, we develop the three plates side by side in a dish, or better still, in a tank, and thus escape the temptation to lift any one of them from the developer for inspection, which would be liable to impair the uniformity of development. Having fixed, washed and dried the negatives, we are ready for the next step, which is to make the bromide prints.

The paper employed for this purpose should be cut off from a roll, each piece in the same direction of the grain to secure equal expansion during the subsequent treatment. The Raydex Co. supply bromide paper in rolls for this purpose in two grades, fast and slow. We now cut off four from the roll, one for each of the negatives and a smaller piece for use as a trial exposure; providing the negatives have been correctly exposed the time required to obtain a good print from the green negative is the correct exposure for all three. Having marked each piece of paper R, G, and B, in pencil on the back to correspond with their respective negatives, we proceed with the printing; they should preferably be printed side by side simultaneously, but if the size of the negatives or the limitations of the source of light prohibit this they may be printed in succession, taking care that identical exposures be given and that the intensity of the light is stable. They are then soaked in cold water for a little while and developed together in the same dish with amidol or M.Q.—developing them right out as would be necessary for subsequent sulphide toning or the Carbro process.

Having thoroughly fixed and washed the prints, the next stage—the making of the colour positives—may be proceeded with, or the prints may be dried and operations continued at a later date; from now onwards all the operations may be performed in daylight.

For the third stage, the making of the colour positives, the following articles are necessary:—

Three transparent celluloid supports.

Three pieces of pigmented tissue or "colour sheets," yellow, red and blue, cut slightly larger than the bromide prints in use.

Two dishes, one preferably large and deep.

Sensitising solution. Waxing solution. Flat squeegee.

About half an hour before they are needed the three transparent supports are waxed by pouring a few drops of the waxing solution on a clean, soft rag and rubbing it lightly over the support. If there is an excess it should be polished off with a clean rag, taking care to leave no streaks; but it is essential that the whole surface be covered, else there will subsequently be difficulties in stripping the final paper support.

If the bromide prints have been dried they must be soaked in water until limp and then placed on clean glass supports, e.g., clean negative glasses.

Now fill the larger dish with clean, cold water and immerse the three-colour sheets until limp—they will soon uncurl, and should remain in the water for two or three minutes—longer in hot weather—after which they are hung up to drain. Now proceed to measure out the sensitising solution, which is done by taking 1 dram of Raydex No. 1 and No. 2 solutions and making up with water to 1 ounce. The preparation of this solution should be left till the last moment, as chemical action between them starts at once. It will be found that one ounce is sufficient to sensitise three ½ pl. sheets, but care must be taken to avoid air-bells. In dealing with the colour sheets as in the case of the negatives, each must have identical treatment, and the operations should be carried through in the order in which they have been commenced, say, red, green, blue.

Now take the yellow colour sheet and immerse it in the solution, dispelling any air-bells, when it may be followed by the red, and lastly the blue; the duration of this bath is two minutes, during which time the dish must be rocked and the sheets continually moved. At the end of this period remove the yellow colour sheet with the left hand, and with the right take up the bromide print from the blue negative with its glass support, immerse both under water, and quickly slide the colour sheet on top of the bromide, holding them firmly so that there is no slipping, as chemical action takes place at once, and any movement would give rise to a double image. Remove them instantly, taking care that the surplus solution falls into a sink or other receptacle and not into the water, as, even in a weak state, it will work havoc with the succeeding bromides; squeegee them firmly together, again avoiding any slipping or movement, and then treat the "green" bromide with the red colour sheet, and, lastly, the "red" bromide with the blue. Now remove them from their glass supports, yellow, red, and then blue, and place them between blotting paper under a flat weight for about twenty minutes, when the action will be complete. It is recommended to practise applying the colour sheets to the bromides with two pieces of paper until dexterity and confidence are attained, as there must be no fumbling at this stage; subsequently, everything is plain sailing. The sheets should be applied as quickly as possible, otherwise loss of detail in the high-lights is liable to ensue.

When the twenty minutes has expired, place one of the waxed transparent supports on a level surface—a piece of plate-glass is excellent—and taking the yellow colour sheet with its bromide, gently strip the two apart, placing the latter in a dish of clean water: immerse the colour sheet in another dish of clean water for a few seconds, then drain and place upon the support; squeegee in all directions, and then place a piece of dry blotting paper on the back of the colour sheet and squeegee thoroughly to remove all moisture, or subsequent frilling may occur. Repeat this performance with the red and the blue sheets. After a thorough washing, the bromide prints may be re-developed and used again.

"Development" can be proceeded with immediately. This consisting of placing the supports in water at a temperature of 115 deg. F. After a minute or so the backing may easily be removed, and, having served its purpose, is thrown away, when the supports will be seen to be covered with a thick coating of pigment. To remove the superfluity of this they are moved about face downwards under water, holding them vertically at times to allow the pigment to drain away, but do not always drain in the same direction. At the conclusion of this stage the celluloids may be very gently mopped with a camel hair brush to remove any loose particles of pigment; they are then placed in cold water for a few minutes and set aside to dry. I have usually found it advisable to develop the yellow positive by itself, as otherwise particles of the yellow pigment adhere to the red and blue.

We now have three colour positives on celluloid supports, and it only remains to combine them on a final paper support—I am for the present dealing only with single transfer. Take a piece of transfer paper, soak it in clean cold water for about half an hour, then immerse the yellow colour positive and bring them into contact underneath the water, place them on a flat surface, gently squeegee, and set aside to dry, when, by slightly bending the celluloid, the transfer paper will leave the support, carrying with it the yellow print. Now moisten a soft cloth with petrol and gently rub the surface to remove the wax, finishing off with a clean cloth. Repeat this operation two or three times to make sure that the wax is removed, otherwise it may be difficult to strip from the next support, and then soak in water for a few minutes with the red positive. Remove them in contact, and quickly move the print about until it is in exact register with the red colour positive; then squeegee carefully so as not to disturb the registration, and put aside to dry, when the paper will leave the support carrying the yellow and red prints combined. Remembering to clean the wax off carefully with petrol, the same operation is repeated with the blue colour positive, and, when dry, the picture is complete. It will then have a highly glazed surface, which may be removed if desired by cleaning with petrol, followed by a short soaking.

The single transfer process necessarily gives a picture which is reversed. In some cases this is quite immaterial, *e.g.*, in flower studies, etc.; but when reversal is undesirable, the double transfer process must be used. Personally, in all cases I much prefer it to the single.

In this case a piece of temporary paper support is soaked in water for ten minutes, and then applied to the colour positives in precisely the same manner as in the single transfer process, only it is obvious that now the order of assembling must be reversed, *i.e.*, blue first and yellow last. When the three colour positives have been registered on the temporary

paper support the latter is treated with petrol to remove the wax, and then soaked in water for two or three minutes together with a piece of final support a little larger than the size of the picture—the Raydex Company supply the latter, or any of the smoother Autotype papers are excellent. Remove them in contact, squeegee, and then place between blotting paper for about five minutes. At the end of that time place them in water at a temperature of 120 deg. F. with the final support uppermost. The latter should be kept dry. After two or three minutes, turn them over so that the temporary support is uppermost, and submerge them under water, when the temporary support may be carefully stripped off, leaving the picture on the final support. Having consideration for the fact that three negatives are required and the present cost of plates, it is satisfactory to know that whole-plate prints may easily be made from small negatives by making enlarged bromides in place of contact prints; the exposures, of course, must all be accurately timed and all identical.

The process may appear very lengthy, but in reality it is not so. I have frequently made a colour print in a morning. Moderate heat may be employed to dry the colour positives on their transparent supports and in their various stages, and this hastens the proceedings. Having made the negatives, the remainder of the process should be an ideal one for the winter evenings.

H. J. CAMPBELL.

A MODIFIED TWO-COLOUR PROCESS.

In Patent Specification No. 169,533, granted to Mr. J. F. Shepherd and Colour Photography, Ltd., a process is described in which a yellow image is added to the combination of blue, green and pink. It is pointed out that a method of colour photography of this class has been described in Patent No. 26,608, 1910 (of Pfenninger and Townsend; no patent granted on the application.—EDS., "B.J."), in which a compensating colour-positive is prepared to be used as a third or fourth part print in a complete colour print for strengthening certain of the colours in the other colour-positives utilised in the resultant coloured photograph.

The present invention relates essentially to a modification of a two-colour process. It is known that a two-colour process by itself will not, generally speaking, reproduce in correct natural colours the colours or tones of a subject possessing several different colours. The invention, while still not being intended to reproduce exact natural colours, does effect an improvement of the result generally obtained by a simple two-colour process and results in a more pleasing picture.

According to the invention, in a two-colour process of the class described, one of the two negative-records is a record mainly of the green constituents of the object and the other is a record mainly of the red constituents. The positive image produced from the green record negative is coloured magenta or minus green and the positive image from the red record negative is coloured blue-green or minus red, and the two positives so coloured are combined in register with a third positive record which is coloured yellow and is obtained by superimposing the two negative records and obtaining a positive print therefrom.

Preferably the two-colour record negatives are produced simultaneously on two superimposed sensitive surfaces whereof the front surface, that is the one receiving the incident light, may conveniently be an ordinary non-colour-sensitised surface. One such method of producing two-colour record negatives and positives therefrom is described in the Patent Specification No. 134,238 (of W. Friese Greene and Frank Garrett. "B.J.," 1919, December 12, p. 728.—EDS.).

In carrying the invention into effect in the preferred manner, two dry plates are placed film-to-film and exposed in the camera, the emulsion nearer the lens being sensitive to blue and green mainly, and the other being sensitive to red; for example, a panchromatic plate. The screening effect of the first emulsion (which may be an ordinary non-colour-sensitised emulsion), due to its yellow colour, enhanced, it may be, by dyeing the emulsion suitably or by interposing a coloured filter film between the two emulsions, will ensure that the image produced on the second or rear plate will be mainly a record of the red constituents of the object, while the first or front negative will be a record mainly of the green and blue constituents, or, if a yellow light filter is placed in the path of the rays from the object, mainly a record of the green constituents.

From the first or green record negative a positive image in a magenta or minus green colour is produced, preferably by projection, the colour being produced by any one of the many well-known methods, for instance, by toning.

Similarly, from the second or red-record negative is produced a blue-green or minus-red positive.

Finally, the two negatives are superimposed in register, forming in effect a single negative image which is a record mainly of the red and green constituents of the object, and a third colour positive is produced from this composite negative, this positive being printed, toned or otherwise coloured yellow.

The three-colour positives thus produced are then superimposed in register to form the final picture, and owing to the effect of the yellow positive, which plays to some extent the part of the blue-sensation print in three-colour photography, the colour rendering is a much closer approximation to the original colours than would have been possible if only two colour positives, prepared from the originally exposed negatives, had been used.

It is, of course, obvious that the process detailed above may be varied in many ways without departing from the invention.

The positive images may be produced by any of the well-known methods either as transparencies or opaque prints; for instance, they may be pigment "carbon" prints, toned silver prints, or mordanted dye images. In the production of a coloured picture on paper one of the images may be a toned or otherwise coloured bromide print, the other two being transferred in register thereon from a temporary support or backing.

A colour-photography process of the class described which consists in preparing two negative-records, one of which is a record mainly of the green constituents of the object and the other is a record mainly of the red constituents, preparing positives therefrom and colouring the image of the positive of the green record negative magenta or minus green and the image of the positive of the red record negative blue-green or minus red, preparing a third positive by printing from the two negative-records combined and superimposed in register, colouring the image of the third positive yellow and combining the three colour positives in register.

THE TRIST THREE-COLOUR CAMERA.

In the "Colour Photography" Supplement for December 2, 1921, p. 48, we reprinted a short description of the camera designed by Mr. A. Ronald Trist, in the shape of an article by Mr. W. Penrose Gimble in "Penrose's Annual." The patent specification of Mr. Trist (No. 164,476 of March 6, 1920) adds some further particulars to those already given.

The invention relates to cameras in which three plates are successively exposed through filters and in which no reflecting or deflecting means are introduced into the path of the light passing through the optical system.

Means are provided to enable the effective aperture of each filter to be independently varied so that the exposure value of all the filters can be made similar and the actual time of the successive exposures constant regardless of the specific relative exposure value of the filters.

An apertured disc having a filter in each aperture may be so pivoted relative to the axis of the optical system that upon rotation about its pivot each of the filters will in turn be correctly placed about the axis. Each aperture, in addition to a filter, has a diaphragm so that the effective aperture of each filter may be varied as desired within limits. By means of the diaphragms, it will be obvious that, the exposure value of each filter may be adjusted to a suitable standard, *e.g.*, the exposure value of the slowest filter. In association with the optical system a shutter of suitable type and a magazine for colour sensitive plates, or films, are arranged in suitable relation, means being provided which, upon operation, make the repeated exposures and suitably change the filters and sensitive media until the required number of exposures have been made.

In use three colour filters are usually employed blue, green and red, and the effective aperture of these filters adjusted to comply with the maker's directions as found upon packages of colour-sensitive plates or films, so that a definite and uniform exposure may be given through each filter. When these adjustments have been made all that remains is to expose one sensitive plate through, say the blue filter for the predetermined period of time, change the sensitive plate and expose the next sensitive plate through, say, the red filter for the same period of time and similarly expose the next plate through the green filter, all of

which operations can be automatically effected in proper sequence by mechanically associating the plate-changing, filter-changing and shutter-operating gear.

In fig. 1 *a* is a disc pivoted at *b* and having four circular apertures formed therein; one aperture *c* is left blank and enables ordinary photographs to be taken when desired, for which purpose an ordinary iris *o* is employed in association with the optical system in the usual way, the iris *a* being maintained at full aperture when exposures through the filters are being made. The next aperture is provided with a blue filter *d*, and iris *e*, an iris-operating handle and pointer *f* and a scale *g* for enabling the diameter of the effective aperture through the iris *e* to be easily ascertained. The next aperture is provided with a green filter *h*, an iris *i*, an iris-operating handle and pointer *j* and a scale *k* for enabling the effective diameter of the aperture through the iris *i* to be easily ascertained. The last aperture of the series is provided with a red filter *l* which is also provided with an iris *m* an iris-operating handle or pointer *n* and a scale *z*.

The disc *a* may be rotated by a spring and controlled by an escapement device of suitable form to enable a step-by-step movement to be made by the disc *a* for disposing the filters in front of the optical system in proper sequence. Starting from the position indicated in fig. 1 which shows the blue filter *d* in place, the first operation might expose a plate; the second operation might simultaneously change the plate and release the disc *a* so as to place the red filter *l* in position; the third operation might expose another plate; the fourth operation might simultaneously change the plate and release the disc *a* so as to place the green filter *h* in position; the fifth operation might expose another plate, and the sixth operation might change the plate and release the disc *a* so as to bring the clear aperture *c* in front of the optical system.

To enable the above series of operations to be repeated the disc *a* is rotated by hand backwards by means of the handle *p*.

Whatever may be the mechanism or the sequence of operations employed it is absolutely essential for good results that the exposures through the three filters should be made with the smallest possible time interval between them. To attain this result the actual exposure time period through each screen is made constant and the aperture for each exposure is suitably modified to enable this to be done.

The necessary modification is effected by varying the effective diameter of the iris *i* and the effective diameter of the iris *e* relative to the effective diameter of the iris *m*.

Assuming that a lens having 150 mm. focal lengths is employed, the manufacturers have marked the packet of plates 6, 9, 12, for the blue, green, and red exposures respectively, and it is decided to stop the lens down to *f*/8. The effective diameter of aperture

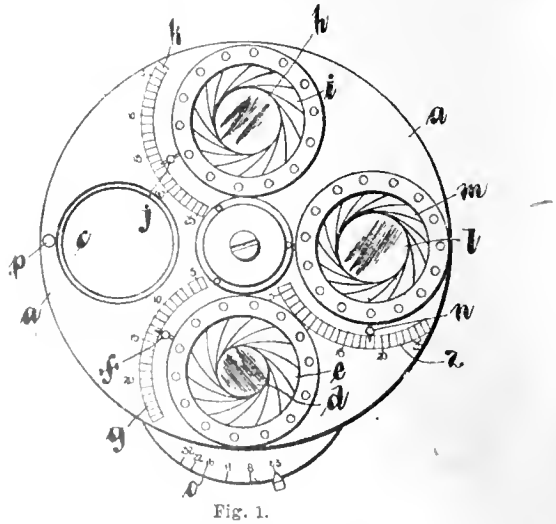
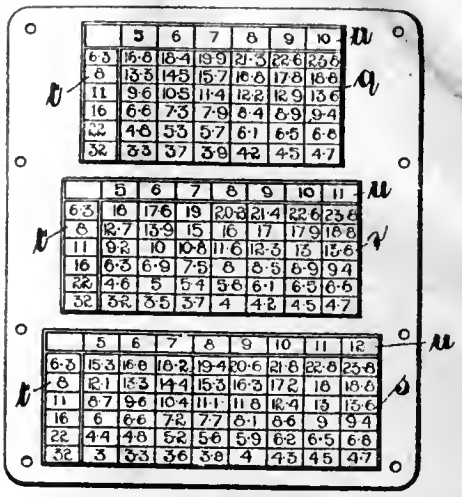


Fig. 1.

with such a lens at *f*/8 is approximately equal to 18.8 mm., and the iris *m* is adjusted to give this effective diameter to the aperture through the red filter *l* when exposure is effected. The manufacturer's indicator shows that the exposure through the green filter is to be three-quarters of that through the red filter, accordingly the area of the effective aperture of the green filter *h* is made three-quarters of the area of the effective aperture of the red filter *l* by moving the pointer *j* to a position on the scale *k* which indicates that the diameter of the aperture of the iris *i* is approximately 16.3 mm.

The iris *e* of the blue filter *d* is similarly adjusted and its pointer *f* is moved to a position on the scale *g* which indicates that the apertore of the iris *e* is approximately 13.3 mm., that is to say the ratio of the effective areas of the apertures throngh the blue and red filters is as 6 is to 12.

Referring to fig. 2 the tables *q*, *r*, and *s* enable the required diameters to be readily ascertained. The table *q* is for use when the highest value in the manufacturer's indicator is ten, the table



t	5	6	7	8	9	10
6·3	16·8	18·4	19·9	21·3	22·6	23·8
8	13·3	14·5	15·7	16·8	17·8	18·8
11	9·6	10·5	11·4	12·2	12·9	13·6
16	6·6	7·3	7·9	8·4	8·9	9·4
22	4·8	5·3	5·7	6·1	6·5	6·8
32	3·3	3·7	3·9	4·2	4·5	4·7

t	5	6	7	8	9	10	11
6·3	16	17·6	19	20·3	21·4	22·6	23·6
8	12·7	13·9	15	16	17	17·9	18·8
11	9·2	10	10·8	11·6	12·3	13	13·6
16	6·3	6·9	7·5	8	8·5	8·9	9·4
22	4·6	5	5·4	5·6	6·1	6·5	6·6
32	3·2	3·5	3·7	4	4·2	4·5	4·7

t	5	6	7	8	9	10	11	12
6·3	15·3	16·8	18·2	19·4	20·6	21·8	22·8	23·8
8	12·1	13·3	14·4	15·3	16·3	17·2	18	18·8
11	8·7	9·6	10·4	11·1	11·8	12·4	13	13·6
16	6	6·6	7·2	7·7	8·1	8·6	9	9·4
22	4·4	4·8	5·2	5·6	5·9	6·2	6·5	6·8
32	3	3·3	3·6	3·8	4	4·3	4·5	4·7

Fig. 2.

r is for use when the highest value in the manufacturer's indicator is eleven and the table *s* is for use when the highest value in the manufacturer's indicator is twelve and obviously more tables may be employed if desired.

The first column *t* of each table refers to apertures in focal units which are the effective apertures employed with the filter associated with the highest value the top row *u* of figures in each table refers to manufacturer's exposure indicators and the intersections of a horizontal line through the aperture in focal units employed with such filter and vertical lines through the particular indicators required will give the diameters of the apertures for the other two filters. The dotted lines in tables *s* refer to the actual settings referred to above.

THE GORSKY PROCESS OF COLOUR CINEMATOGRAPHY.—Particulars of a further stage in the development of the process of colour cinematography invented by Professor S. de Procoudine Gorsky are given in the December issue of our contemporary, "Conquest" (The Wireless Press, Henrietta Street, London, W.C.2, 1s.). These relate to the design of the camera, or rather of the optical device by which three separate images are obtained from a single viewpoint. Professor Gorsky divides his light before it enters the lenses, and uses for this purpose a system of three right-angled prisms. The longer sides of two of these are coated with bands of reflecting silver deposit. In the case of the prism which receives the light from the subject the bands occupy two-thirds of the space, each band being twice the width of the intervening bands. By this prism one-third of the light is transmitted and two-thirds reflected to the second prism, which in turn reflects one-third and transmits one-third. The three separate pencils of light, traversing different optical parallel paths, are taken up by three lenses, which form corresponding images on three separate bands of film, the gates of the films being placed in "staggered" fashion to the front surface of the prism block. Accessory non-refracting blocks form part of the system as means for equalising the absorption of light. It is claimed for this system, which we believe is a new device in making three-colour negatives, that it provides identical images. Our contemporary, "Conquest," reproduces a number of photographs of the cinematograph camera which has been built by Messrs. Cinechrome Instruments, Ltd., for carrying the system into effect. At the present time Professor Gorsky is at Nice engaged in making a series of films with the new instrument.

No. 183. VOL. XVI. FEBRUARY 3, 1922.

THE BRITISH JOURNAL OF PHOTOGRAPHY

MONTHLY SUPPLEMENT

ON

Colour Photography.

CONTENTS.

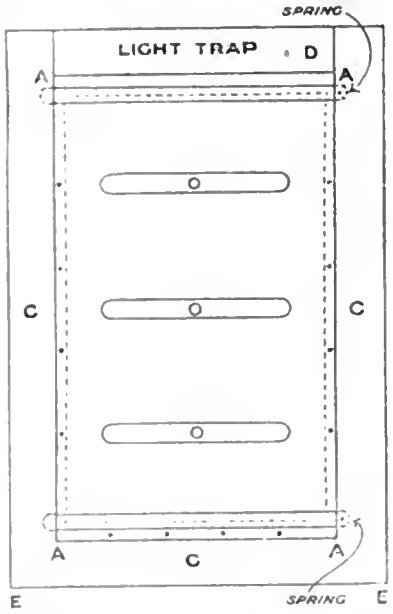
A PLATE-HOLDER FOR THE PAGET COLOUR PROCESS.

The lack of an efficient dark slide adapted to its needs has, to my mind, always been somewhat a drawback to the Paget process of colour photography. Some photographers that I have known have adopted this process with a view to making all their lantern slides with it, and, after a cursory glance at the maker's instruction, have loaded the best slides for the purpose that they happened to have, and when the resulting positives failed to register, blamed the seeming uncertainty of the process rather than the fact that their own procedure had made success very problematical. It cannot be too strongly impressed upon photographers adopting this beautiful process, that it is not sufficient to have the two plates in contact in the dark slide, but the latter must be so made or adapted that the contact is over the *whole* area, and not merely local, as sometimes happens, with the result that while one part of the transparency will register satisfactorily, others show only patches of false colours. The ordinary pattern of double dark-slide has been fairly satisfactory in my own work if strong springs are employed to supplement the central springs upon the metal dividing plate. When doing this there is always the danger that while sufficient contact is secured between the two plates the action of the springs is also forcing the slide apart, allowing the admission of light. These facts have led me to design the slide described below. Though primarily adapted for a 3¼ by 2½ pocket camera, the idea may be adopted for almost any make of instrument. I do not claim that there is anything original in the idea, but that it may be very satisfactorily employed for the purpose intended.

A general idea of the slide may be gathered from the drawing which shows the slide empty. It will be seen that three springs are fastened at the centre, which provide the requisite pressure from the back of the negative plate, while across the tops of the plates and at their extreme tops and bottoms are two extra springs holding them in position in the slide, and also ensuring contact. These are fastened at one side, pass across the two plates, and fasten in a recess notched out of the woodwork at the opposite side, A A, after the fashion of the older printing-frame springs. Four small pins are fitted two at each end, with two at the side, with the object of assisting in putting in the plates and also in keeping them square with each other. The position of the plates is shown in the sketch by rectangular dotted lines. It will thus be seen that the negative plate and its taking screen are squeezed together with a double pressure from both back and front, which ensures absolute contact.

The construction of such a slide is a fairly simple matter for anyone skilled in the use of simple woodworking tools, or one of the photographic cabinet makers would doubtless undertake the work at a reasonable cost. If the work is to be done at home the worker should set about it in the following manner. No dimensions can be given, since these vary with individual cases.

The base of the slide should be first cut out. This should be of fairly thick wood, according to the size of the slide, or from about 3-16 in. thickness for a small size up to ⅜ for a larger one. The three central springs should be first



fitted to this. They should not be too strong, and may range from about 3-16 in width for the small sizes to ¾ for the larger ones. Old clocksprings may be made to serve for this, and they should be bent into a half-moon shape and fastened to the slide with a screw through a hole drilled in the centre. The two other springs shown at A A in the sketch should then be fixed at one end at each side in the position shown. The sides c c c may then be attached with glue, and, after the latter has become well set, small screws may be inserted flush with the woodwork. These sections, c c, should be provided

with grooves or a projection, according to the design of the camera back at the edges. A plush light-trap should be fitted at the top, as shown at D. Care must be taken to see that the sections c c c are deep enough to allow the springs A A with the plates in position to be clear of the draw-out shutter. The grooves for the latter may now be fitted, and for lightness and saving in space I recommend that both the grooves and the draw-out shutter should be made of stout sheet zinc. A very simple way of fitting these is to first fix a strip of rather thicker zinc at the outer edges c c c, and over this a wider piece that completely covers these sections, taking care to get a good light-tight joint at the corners E E. Thus a channel is formed for the draw-out shutter to slide in. The latter may then be cut out after the usual pattern. The whole of the inside of the slide may be given a coat of dead black paint, which also gives a good finish to the metal work; the rest of the outside woodwork may be given a coat of varnish or finished in the same way at the discretion of the worker. If carefully made the above design allows little chance of light-leakage: if, however, this occurs, it may be due to faulty joints, which should be filled up with beeswax or putty.

To load the slide for Paget colour work, place the plate and its taking screen in the correct position within the pins on the central springs, and then bring the others A A across into the recess cut for each on the opposite side.

One point may be raised, *i.e.*, that of register. In the case of larger apparatus having deep slides, this may not be altered, but in the case of the smaller apparatus using thin metal plate-holders there will no longer be correct relation between the plate and focussing screen. In any case it is just as well to make a test of this by the very simple method described in the editorial article in the "B.J." Almanac for 1920, page 300, and I take the liberty of quoting it. "Insert a tapering strip of card between the focussing screen and a stiff flat ruler, such as a steel rule, laid across the frame of the screen. Secondly, make the same test on the plate holder with the plate in position and the rule laid across the face of the holder. The wedge of card should come to the same place in both cases, and a very slight error in register may be detected in this way."

I should suggest that if the error in register is found to be considerable that a new focussing scale be made and fitted or that the camera front be racked in, after focussing, the exact difference in register as indicated by the triangular wedge above mentioned. This should always be carried in the camera case.

R. M. Fanstone.

COLOUR CINEMA FILMS FROM LARGE AND SMALL NEGATIVES.

[The following is the description of a process patented by Zoechrome, Ltd., and Thomas Albert Mills for the production of "self-contained" cinema films in natural colours. It will be observed that the inventors propose to take a full size key film, which may be black or in a given colour, and to combine the positives therefrom with colour positives from smaller negatives by enlargement of the latter according to a process protection for which is granted in Patent No. 172,714.]

This invention relates to an improved method of producing cinematograph films in which each individual picture is a complete colour rendering of the subject.

There are produced upon the negative film (by the aid of suitable colour screens) a set of images of full or normal size (key images) and interposed sets of small sized colour-giving images, each preferably of half the linear dimensions of a key image. The small colour-giving images may be three in number, corresponding to the usual triple division of colours, and the key image taken without a colour screen so as to give the black and white effect only. Or the key image may also be a colour image, giving, say, the blue in the resulting positive film, either the blue being printed alone, from the negative key image, or by a double printing both the blue and a similar black and white or true key image, and only two small images may be produced. Each key image and its associated small images are taken simultaneously through separate lenses, and, as the lens for the large image has to have a correspondingly greater focal length, and if employed to give a direct image would form an obstruction for the small images, the increased focal length is preferably provided for by a prism or other reflector, allowing all the lenses to lie in the same plane. This displaces the key image from its corresponding colour images, and therefore the key and colour images of one exposure are interposed between the key and colour images of other exposures.

In producing the positive film from the original negative, the latter is moved at each operation through a distance equal to a key image and the following small colour images, closing up the key images on the positive film so that they are reproduced in succession without the interposition of the colour images, these being afterwards enlarged and superposed. The reproduced image, if the key image is to be in one of the colours employed, say blue, is suitably coloured or dyed, but if the key image is black and white the usual process only is employed. Or the same large image may be reproduced twice, once as a black and white image and once in colour. The reproduced key film is then coated with a sensitive emulsion, and one of the colour sets of images is then enlarged to the key size and superposed upon the key images, the new positive images being coloured to the required colour, complementary to that of the colour screen employed for the negative. The next set of colour-giving pictures is similarly superposed, and, in the case of the process employing black and white key images and three colours, the third set of colour images is then superposed, with the result that the finished film is a complete colour rendering of the subject, and can be projected by the usual apparatus upon the screen. The apparatus employed for producing the positive may be of the type described in Middleton's Patent, No. 16,353 of 1913 ("B.J.," September 18, 1914, p. 715). It is to be understood that the term "key image" is used in a wide sense, as the image which is originally taken of full size and thus serves as the most important image in giving definition to the picture, but it is not necessarily an opaque or black and white image in the positive picture.

In the drawings, fig. 1 is a diagram illustrating the production of a negative having a set of key images and three sets of colour-giving images; and fig. 2 is a similar diagram illustrating the case in which the key image is also one of the colour-giving images.

In fig. 1, A is the negative film. B, B are the key images of full size. C, C, C, are three sets of half-size colour-giving images arranged with one central image and two images side by side. D, D^1 are the camera lenses, of which the larger lens D is of twice the focal length of the smaller lenses D^1. E is a prism reflector. The lenses are arranged as shown at the right of the figure, the small lenses forming a triangle below the large lens. The triangle may be inverted to bring a pair of small lenses close to the large lens and leaving only one small lens at an appreciable distance. The reflecting prism E is arranged so that the pencil of light from the large

lens D, indicated by dotted lines, is reflected from the lower and upper surfaces *e*, *e'* and on to the film A, a distance of two full images existing between the resulting image and the images due to the lenses D¹. The length of the path from the large lens to the film is twice that of the direct path from one of the small lenses to the film so that the increased focal length of the large lens is provided for while allowing the lenses to be placed in the same plane. The shutter mechanism and the colour screen are not shown as they may be of ordinary type.

In fig. 2 the key pictures B¹ are produced by the aid of a colour screen, say red, and instead of separating the images

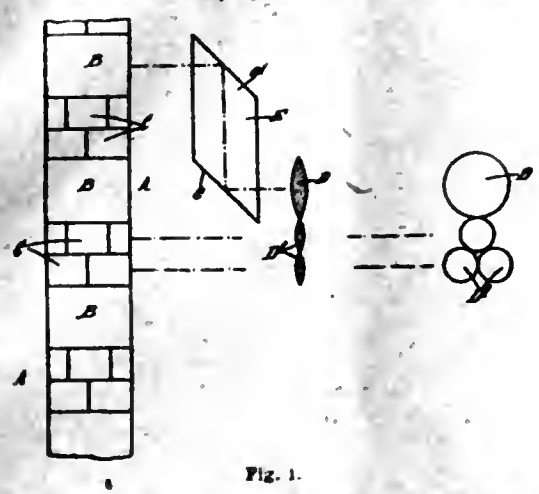


Fig. 1.

by a full picture width as in fig. 1 the separation is of half a picture width only, to accommodate a pair of small colour images C¹ taken through the two other colour screens of the set of three. The small lenses D² are placed symmetrically below the large lens D. Otherwise the arrangement is as in fig. 1, and the prism reflector E doubles the distance of the path from the lens D to the film.

In producing a positive from the negative film as shown in either fig. 1 or fig. 2 the key image is thrown upon the positive film and the negative film is moved for each exposure in the apparatus through the space of two pictures or a picture and a half according to whether the arrangement of

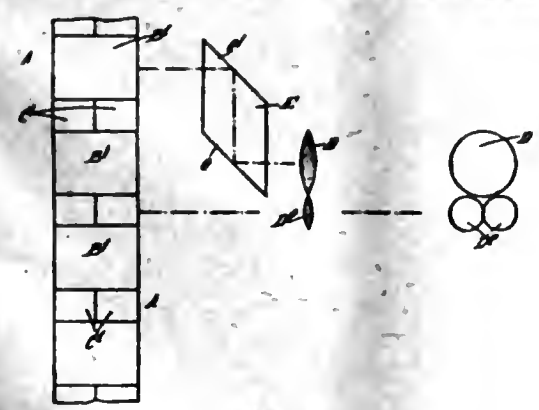


Fig. 2.

fig. 1 or fig. 2 is employed, the positive film being moved one picture space at a time. The positive film with the key images on it is then developed and fixed and may be varnished before sensitising again. If the key image is also a colour one the positive image is coloured to, say, blue. Or a black and white key image may be used and a second printing from the large images taken and coloured.

The resensitised positive film is again exposed and the enlarged images of one of the sets of small colour images superposed upon the key images. The lens system employed for copying is arranged to give the required enlargement, while for the key pictures, the original and reproduced images are of substantially equal size. The images B and C having been relatively displaced by the action of the reflector, the colour images superposed must be those separated by the intermediate images, as indicated by the dotted lines in the drawings, so that the colour images shall be those taken by the same exposures as the key images on which they are superposed. The positive film is coloured and resensitised again for the second colour set, the operations being repeated where a key picture and three small pictures are employed as in fig. 1. The final result is a positive film fully coloured and adapted to be projected by the usual projecting apparatus. The three-colour system has been taken as the basis of the method described and illustrated, but it is obvious that other colour systems may be used.

Owing to the fact that the key images and the colour images are taken simultaneously the original film should be moved more rapidly than is the case with an ordinary film, since the space of two or of one and a half ordinary pictures has to be covered between each exposure, while the coloured positive is moved at the normal speed for projection. Since the key image is of full size the projection on the screen gives a clearness of impression substantially as good as that of the ordinary uncoloured picture. To obtain this clearness it is not essential that the colour producing images should be so sharp, so that the smaller scale on which they are taken does not materially affect the sharpness of the result and the great advantage is obtained that the colour effect is given by an addition to the length of the negative film of only 50 or 100 per cent. according to the colour system employed. The disturbing rainbow effect produced when colour images are taken successively is also entirely eliminated by the simultaneous exposure of a complete set of images.

A NEW METHOD OF MAKING COLOUR PRINTS.

(A Note in "Penrose's Annual," 1922.)

In Volume 20 for 1915 of "Penrose's Annual" we described an interesting method of producing photographic prints in colour invented by Mr. John Lewisohn, of New York, and patented by him in America in 1913. Since that he has invented and patented in America and in England another process which is an extension and improvement on the former one, though utilising fundamentally the same means.

The method consists in first obtaining three negatives through the usual colour filters. A blue print on ferro-prussiate paper (the same as is used for engineers' blue prints) is made from the yellow printing negative. The entire blue part of this print is washed with a yellow dye, such as aurantia. It is then dried and afterwards immersed in a weak solution of silver nitrate sufficiently strong to dissolve the blue and leave the yellow image. The side of the print bearing the image is then coated with a blue-print sensitising medium, which may be applied before the print is dry after the preceding operation.

The re-sensitised print is impressed with an image through the red printing negative, which is adjusted to get the print in register. The blue print so formed is washed with a red dye, such as eosine red, then dried and treated as before with nitrate of silver to remove the blue, leaving the red image on the yellow image previously formed.

The operation of re-sensitising with the blue-print solution is repeated, and a print made through the blue printing negative, taking care to secure register. The print so formed will have the blue colour, so that it is unnecessary to remove this. The result will be a combination print of yellow, red and blue colours superimposed and will substantially reproduce natural colours.

It is self-evident the process can be used for only two or with more than three colours. The principle of the process consists in forming a series of superposing blue images, of which the preceding blue image has been substituted by another colour before the succeeding blue image has been formed. Presumably the washes of colour are applied locally with a brush, otherwise it would seem that the sheet of paper would be completely dyed. On this point the patent specification is not clear. We shall be interested to see further results of this process, which appears to be a very simple method of making colour prints.

WILLIAM GAMBLE.

THE TRIADOCHROME PROCESS OF MAKING THREE-COLOUR PRINTS.

Some months ago, namely, in this Supplement of May 6, 1921, page 20, we had a short note from particulars contained in a local newspaper of the process of three-colour printing worked out by Mr. J. F. Shepherd, of 10, Derwentwater Road, Acton, London, W., by whom the name "Triadochrome" has been given to it. Since then we have had the opportunity on one or two occasions of seeing the process in working and of examining a considerable number of the results, and have no doubt that many of our readers will be interested in hearing more of a method which without question has considerable commercial possibilities and has already found commercial applications.

The process is purely one of three-colour photographic printing from the customary set of three-colour sensation negatives. Mr. Shepherd's work has been directed towards perfecting a method of printing which can be put in operation on a commercial quantity scale with assurance of producing prints of satisfactory colour rendering and also uniform throughout a batch. In doing this he has reduced the operations required for the assemblage of the three-colour impressions to what appears to be an irreducible minimum, and thereby has rendered it possible to produce prints in any reasonable number on the day following the completion of the negatives.

Without going into minor details of manipulation, the process is as follows:—The red print (from the green-sensation negative) is made by the carbon process on a celluloid support. The blue print (from the red-sensation negative) is prepared on a transfer bromide paper, its blue colour being obtained by the ordinary process of iron toning and fixed in a special fixing bath to clear the whites and give a correct blue-green. The blue paper print is squeegeed down in register with the red impression on the celluloid, surplus water is blotted off, and, after remaining for about an hour, the paper support of the blue print can be stripped off, leaving the red and blue impressions together on the celluloid. It remains to add the yellow print (from the blue-sensation negative). This print is made on ordinary bromide paper and toned to a yellow by a special combined toning and bleaching bath process. It is in turn squeegeed on to the composite red-blue print on the celluloid and the whole assemblage allowed to dry. The original celluloid support can then be stripped off dry, leaving the three-colour print on the paper base provided by the bromide paper on which the yellow print was made. We were able to see from prints in various stages of making and from a number of completed results that the process yields quite satisfactory registration of the three images. As regards systematising the production of prints on a considerable scale, Mr. Shepherd provides a small test chart of red, yellow and blue colours, and a white, when photographing the original. This chart is recorded on the edge of each negative taken, and thus, in the making of the component prints, the work can be distributed between three separate departments, in each of which the printer has a standard before him to which he must work as regards depth of print and, in the case of the toned bromides, as regards producing the correct tone. While it is not claimed that the making of these prints is work for the slipshod hit-or-miss printer, experience has shown that printers of reasonable competence can make individually large numbers of red, yellow and blue prints which, when subsequently assembled, yield satisfactory three-colour results.

So far the negatives with which the process has been used have been made by successive exposures in an ordinary camera, and so have been of still-life subjects, such as pottery, paintings, textiles and other articles of manufacture. We have seen some remarkably good three-colour prints of hats and costumes, and Mr. Shepherd has even obtained some striking prints of the show windows of a large department store, photographed at night through the plate glass and by the artificial electric illumination.

Speed of production and uniformity in the results are the two outstanding claims which are made for the process—claims which, so far as our observation has gone, may be thoroughly substantiated. There is undoubtedly a great commercial demand for satisfactory colour photographs, particularly of manufactured goods in textile, pottery, furniture, and other industries, as well as among firms concerned in such businesses as flower growing, interior decoration, etc. The "Triadochrome" process certainly appears to have been brought to a stage at which it is capable of fulfilling such demands.

News and Notes.

BYE-PATHS OF COLOUR PHOTOGRAPHY.—Messrs. A. W. Penrose & Co. have a volume in the press on this subject. It is stated to be the work of a practical photographer who has devoted many years to the study of colour photography, and who prefers to conceal his identity under the pseudonym of "O. Reg." The volume is announced to deal with colour cameras, filters, colour-sensitising of emulsions, and the making of colour transparencies and prints.

THE GLORIOUS ADVENTURE.—The public exhibition of the film, "The Glorious Adventure," in natural colours by the Prizma process was begun a week or so ago at Covent Garden Opera House, London, W.C. More than ordinary interest attaches to it, since it is the first production of a drama or story cinema film in colours by a photographic process. When we referred (in this Supplement, May 6, 1921, p. 18) to last year's exhibition of Prizma colour films we had to point out that, while the results were most certainly a triumph of printing, the negatives were evidently made by the ordinary method of exposure, so that there was lack of identity between the images of each trio representing the three colour-sensations. Hence, in cases of rapid movement of the subject, there was the production of colour fringing around the outlines of objects in movement. As has already been announced, this disability has been removed by the design of a camera which yields identical images in each trio of exposures. The pictures now included in "The Glorious Adventure," which is a full-blooded drama with any amount of movement, emphatically show that this defect has been removed almost completely. At one or two places there was a momentary splash of what may be called stray colour, but possibly this was due to other causes, for example, accidental mechanical damage of the film. It is not too much to say that, so far as colour fringing is concerned, this difficulty has been overcome by the experts of the Prizma process.

When we come to the technical quality of the film, considered as a piece of animated photography in colours, it is necessary, in expressing an opinion, to distinguish between two kinds of scene. The action takes place very largely at close quarters, and almost without exception the photographic quality and the colour quality are both of them altogether excellent. In many instances the renderings on the screen of these phases of the story are supremely beautiful, and exhibit the most delicate colour tonalities of complexions and dresses, which are a veritable modern miracle when one has in one's mind the tiny postage stamp transparencies which are projected. We imagine that it is phases of this kind which have prompted some of the most appreciative eulogistic notices in the newspapers, a typical specimen of which is that the film is "a thousand oil paintings come to life." But as regards the more open scenes, whether outdoor or in the studio, it must be said that the photographic and colour qualities are of a much lower standard than that of the "close ups." We are afraid we can only say that this is so without being able to assign the cause. In some of the general studio scenes lack of sufficient illumination appeared to be indicated; some of the film had the appearance of being under-exposed. But the general outdoor scenes, for which, presumably, there was plenty of light, frequently were seen to suffer from an unnatural colour rendering in those parts which were relatively distant from the camera. We believe this is a difficulty in colour cinematography which is generally experienced, and which is perhaps associated in some way with the action of ultra-violet light. Then, again, the task of stage-managing large scenes containing a whole miscellany of colours must have been an enormously difficult one for the producer. When it is remembered how immensely superior the tonal qualities of modern cinema films are in comparison with those of, say, ten years ago, it is too much to expect that the first production under the entirely different conditions imposed by a colour record should be free from discordant notes. Probably all these three causes in various proportions are responsible for the less satisfactory renderings of the general scenes in comparison with those of the "close-ups," where the conditions of distance, lighting and composition are much more favourable. But we do not wish to emphasise these considerations. So much of the film is so admirable that, as a whole, it must be saluted as wonderful, and a very great triumph, even if not an entirely complete one, over great technical difficulties by the producers, Messrs. J. Stuart Blackton Photo-Plays, Ltd.

No 184 VOL. XVI MARCH 3, 1922.

THE BRITISH JOURNAL OF PHOTOGRAPHY

MONTHLY SUPPLEMENT

ON

Colour Photography.

CONTENTS.

FACTS AND FALLACIES IN COLOUR PHOTOGRAPHY

The literature of colour photography is so scanty that any new book appearing on this subject is sure of a cordial welcome, especially when it contains the results of many experiments and much new matter. The author, who partially conceals his identity under the thin disguise of "O. Reg," gives special attention to the problem of the one-exposure camera, and wholeheartedly advocates the single reflector type (Bennetto's principle with compensators). So far, so good, and it is, therefore, all the more to be regretted that he should permit incorrect deductions to mar the value of his book and to treat the labours of others in the same field in a depreciatory manner. As most one-exposure cameras produce the three images by means of transparent reflectors, much space is given to considering the "refraction error," i.e., the error caused in the direct image by the cone of rays from the lens passing through the inclined reflector, and the means of compensation for this. Before dealing with this question, distinct exception must be taken to the statements on pages 9 and 16, that "Cameras on the two-reflector principle, like the chromoscope, cannot give three identical images." The answer to this is that "They do and have done so for many years past," a fact that the author could have easily verified by application to Mr. Butler. I have examined a good many Butler negatives, from whole plate to 4½ × 6 cm., and can assure prospective users of two-reflector cameras that the registration difficulty is a pure myth. A few days ago I took, with my Butler quarter-plate camera, a man-of-war dressed with flags, and the delicate tracery of the rigging provided an excellent test of registration from which the camera emerged with flying colours. It is, in fact, an old controversy, "Do Butler negatives register?" and I should not have raised the point, had it not been for these misstatements, backed up by the diagram of a badly designed chromoscope on page 9, and for the astonishing statement on page 28 that "One-exposure cameras with more mirrors than one, are only theoretical illusions and scientific experiments *ad absurdum*."

Fig. 1.—Camera made according to Patent 12,181 of 1909. Position and shape of prisms are shown by pieces of paper attached to camera. Filter holders and dark-slide resting against back of camera.

Let us, however, consider the refraction error problem more closely. The refracted image differs from the geometrically correct image by having one half contracted and the other half expanded. If the reflectors are parallel, this error is magnified, if they are at right angles, as in White's camera, this error is very nearly eliminated. I have recently designed a camera on the latter principle, and find that the direct refracted image is distorted to the extent that a wedge of glass from 0001 in. to 006 in. would cause, when placed in front of the plate.

The camera in question is designed for a 6¾ in. *f*/4.5 lens to cover a plate 3 in. × 4¼ in. The second reflected image is more difficult to correct, but this can be done by inclining the focussing plane, in spite of our author's denial of this possibility. To return to the Butler camera; how is his registration obtained? It seems quite plain to me that in the course of his

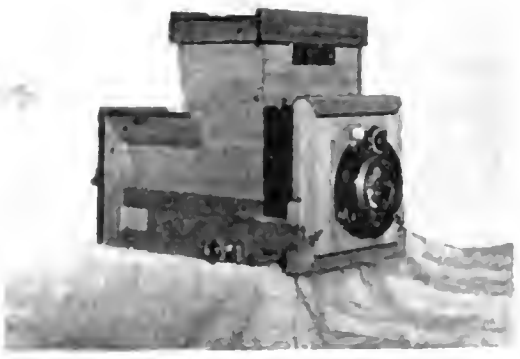


Fig. 2. Butler tri-colour quarter-plate camera.

adjustment, the first reflector is thrown slightly out of the exact angle of 45 deg., which is equivalent to inclining the focussing plane, thereby inducing a slight distortion of the picture, equal to that produced by refraction. In the same way the second reflector is out of the 15 deg. standard by a smaller amount. If the course of the marginal rays be traced it will be seen that astigmatism is introduced into the lens system, whose effect is to increase the depth of focus at the expense of definition, though as far as my experience goes with an $f/6.8$ lens the definition is entirely satisfactory. I have perhaps had to deal rather fully with this point, but the statements made are likely to prejudice people against a type of camera, which I believe to be by far the best for colour photography, and a type, which I hope I may be instrumental in putting on the market for the benefit of colour photographers. At the present time any further reference to this is premature. The principal trouble with a reflector camera is to get the mirrors absolutely plane.

Hamburger and Costen's patent for distorted reflectors is somewhat drastically dealt with on page 34, but I will leave these gentlemen to fight for themselves, merely contenting myself with the observation that I have seen the Polychromide camera, and the finished prints showed excellent registration.

In Chapter IV., which deals with "Real Inventions" in a somewhat sarcastic vein, I find a diagram depicting Ives' camera, patent No. 12,181, of 1900, though the author has "no desire to commemorate these imaginative geniuses." Unfortunately his criticism fails because he is unacquainted with the precise dimensions of the cameras concerned and the degree of stereoscopic error involved. Returning to the realm of fact, we find that Mr. E. Sanger-Shepherd designed and manufactured such cameras, prior to the war, and sold them as landscape cameras. A camera in my possession has an $8\frac{1}{2}$-in. lens, and the stereoscopic separation between top and bottom images is $\frac{3}{8}$ in. Registration is therefore perfect at distances over 10 ft., and I am informed by the designer that prints 20 in. × 16 in. have been made from his lantern-size camera. Two photographs are given of these unfortunate cameras, and I have indicated the position of the rhomboidal prisms on the S.-S. camera.

Space does not permit me to deal with the author's camera. I will only remark that to adjust his exposure ratio by using three plates of different speed is unsound. A far more philosophic method is to use equi-speed plates and a compensating filter on the lens.

His chapter on printing is frankly archaic. I believe that Rotary tricolour films have been off the market at least nine years. Raydex is the modern and easiest method of pigment printing, but there are many others that he might have tried, such as the beautiful dye imbibition process of Sanger-Shepherd and Bartlett, and the D.I.P. process is also most promising.

Notwithstanding these errors there is much of interest in the book, and it is recommended to the favourable notice of colour photographers if they will take the customary pinch of salt.

H. E. RENDALL.

ADDITIVE TWO-COLOUR CINEMATOGRAPH PROJECTION.

[A system of colour cinematography, which is the joint invention of an Italian and a French technician, Cesar Parolini and Gustave Perron, is described in a recent patent specification, No. 145,478. The inventors adopt a method of optical printing of side-by-side half-size positives from the negative taken alternately through orange and green filters. The pairs of positive pictures are combined by a pair of objectives mounted for production of a single composite image on the screen.]

THE invention consists in a process for the manufacture of a cinematographic film for projecting images in colours which comprises the taking of negative images by a cinematographic camera laid on its side so as to give images with their horizontal lines parallel to the length of the film, the speed being twice the ordinary speed of, say, fifteen images per second in order to obtain two images through two coloured screens in the time usually occupied in taking a single ordinary image or three times the ordinary speed in order to obtain two images and a blank, the increase in speed being obtained by the inclusion of a speed-multiplying gearing in the camera; then producing a positive from the negative by projection, the two films being arranged and moved relatively at 90 deg., the printing being effected in such a manner that the two images on the negative are together projected to produce on the positive film two side-by-side reduced images with their horizontal lines transverse of the film, and which occupy the surface corresponding to an ordinary image.

The projection of such a film is effected on an ordinary screen by means of an ordinary cinematographic projector, which is suitably modified instantaneously and momentarily for the purpose.

In the taking of negatives the film, which is an ordinary one, is exposed with the horizontal lines of the images taken parallel with the direction of the length of the film, that is, the taking of a photographs is effected with the cinematograph apparatus laid on its side.

The speed of exposure is about twice the ordinary speed of, say, fifteen images per second, in order that two images shall be obtained during the time usually occupied in taking one ordinary image.

When taking photographs of objects moving at a very high speed, the speed of exposure may be increased to three times or even four times the normal speed of exposure.

The camera differs from an ordinary camera in that, in order to obtain an increase of speed in the taking of photographic negatives, the driving mechanism of the apparatus is modified by the arrangement of a speed-multiplying gearing.

Moreover, and without modifying the shutter, a transparent disc coloured half green and half orange will be arranged in front of the objective, on a rotating axis actuated by the multiplied motion, in such a manner that the two images taken during the time of taking an ordinary image shall be respectively taken through the two colours, green A and orange A^1 (fig. 1), which gives on a

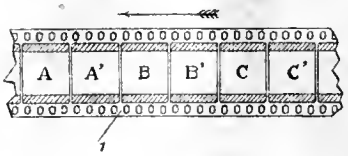


Fig. 1.

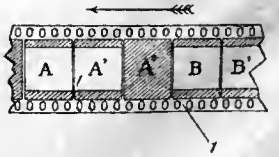


Fig. 2.

panchromatic film, groups A, A^1, B, B^1, C, C^1, etc., of two images for an ordinary one

In the case of the extra rapid taking of photographic negatives where the speed of impression is three times the ordinary one, the multiplying mechanism will be devised accordingly, and the coloured transparent disc comprises three equal sectors, the first one in green, the second one in orange and the third one being opaque, in such a manner that during the time necessary for taking an ordinary image, groups A, A^1, A^0—B, B^1, B^0, etc., consisting of two images and a blank will be obtained, two of which are taken through the two screens respectively, green (A) and orange (A^1) and the other one null (A^0).

The negative film with the images thus obtained is then employed for the production of images on an ordinary positive film in the following manner, which constitutes the second phase of the process.

The printing is effected by projection and not by contact, as shown in the drawing.

The developed negative film 1 passes in the printing machine in a horizontal position, whilst the unexposed positive film 2 is passed vertically, the respective position of the two films being always at an angle of 90 deg. It is also possible to obtain the same result by passing the negative film vertically and the unexposed positive film horizontally.

The arrangement being ensured, the negative 1 is displaced at the

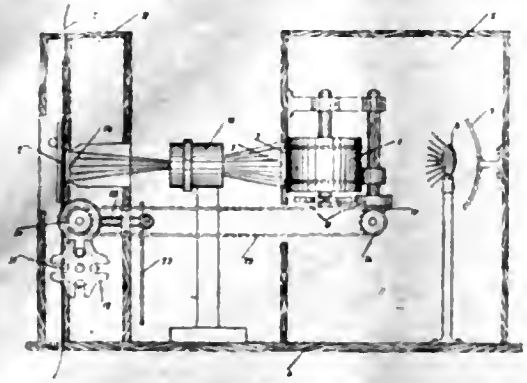


Fig. 3.

rate of one group of images A, A^1 or A, A^2, A^3 for a displacement of a surface of unexposed positive film 2 corresponding to the surface of one ordinary image, in such a manner that the projection by reduction gives the two successive reduced images A, A^1, B, B^1, etc., of each group on the surface corresponding to that of an ordinary image, on the unexposed positive 2, whilst the null image A^2—B^2, etc., in the case of groups with two images and a blank remains out of the projection.

The positive film 2 obtained by the printing method has the horizontal lines in the images transverse to the length of the film as in an ordinary positive film. As shown in fig. 6, each surface 3 corresponding to that necessary for an ordinary image comprises in

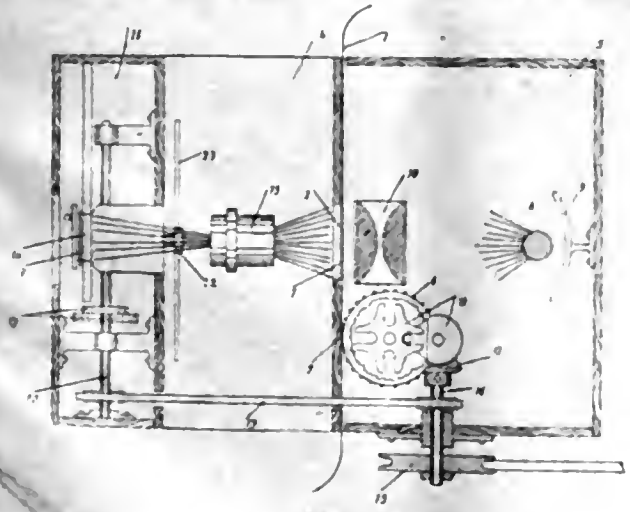


Fig. 4.

this case the two reduced successive images A, A^1—B, B^1 of each group, arranged side by side, in the direction of width of the film, which allows, for projecting purposes, to pass the film as this is done with an ordinary film, that is, vertically.

The printing by projection is effected by means of a printing apparatus consisting of a box or frame 4, enclosing the mechanism (figs. 3, 4 and 5).

A mechanism for causing a horizontal displacement of the negative film 1, by means of a toothed drum 6, is arranged in a back compartment 5, the images being projected through the window 7, by means of any kind of luminous source 8 with reflector 9 and condenser 10.

A mechanism for causing a vertical movement by means of a toothed drum 21 of the positive film 2, which is to be exposed, is arranged in a front compartment 11. The light-rays projected through the negative images by the objective with diaphragms 13 arranged between the two compartments 5 and 11, act upon the film 2, through the window 14.

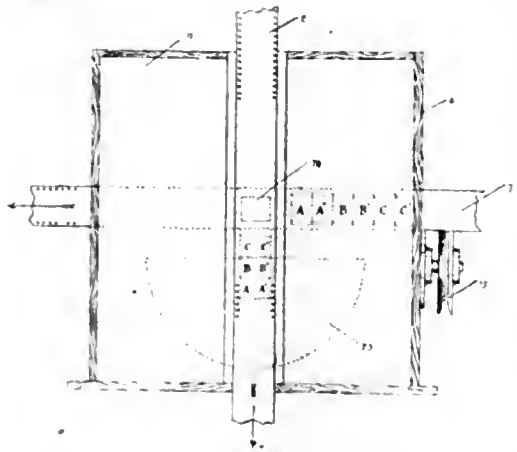


Fig. 6

The means for causing the movement of the drums 6 and 21 are actuated, by any kind of motor, through the pulley 15, the axle 16 of which actuates directly the mechanism by a Maltese cross 18 of the drum 6 by means of bevel pinions 17, and indirectly by means of an endless chain 19, the shaft 20 operating the mechanism by a

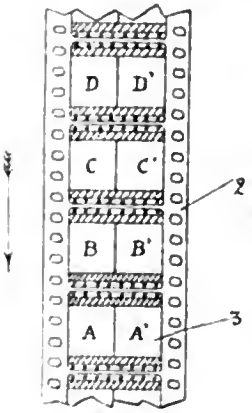


Fig. 6.

Maltese cross 12 of the drum 21, mounted below the shaft 20, the same shaft 20 operating also, by means of bevel pinions, the axis 22 of the obturating sector 23 during the motion of the two films 1 and 2, which motion is calculated so that the positive film 2 shall be vertically displaced in front of the window 14, through a space corresponding to that of an ordinary image, whilst the film 1 (the

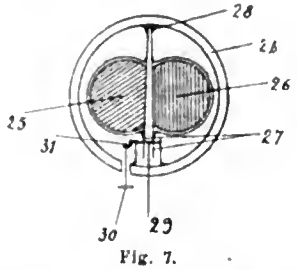


Fig. 7.

drum 6 of which has a larger diameter than that of the drum 21) is horizontally displaced in front of the window 7, through a space equal to two consecutive images A, A^1—B, B^1 or three images A, A^1, A^2; B, B^1, B^2 of each group, the null image remaining non-projected by giving, for this purpose, suitable dimensions to the window 7.

The driving may be effected by means of mechanism, provided with clutches or with eccentrics without affecting the method of printing, and also modifications in the details may be made, the printing apparatus described being by way of example only.

The clearness of the reduced images is not diminished when the positive film 2 is thus obtained.

For projecting the positive film an ordinary projecting apparatus is sufficient, it only being necessary to remove the ordinary objective and to replace it by a special objective which is mounted in its place. Fig. 7 shows a front view of this objective.

The objective comprises a cylindrical mounting 24 inside which two coupled objectives 25 and 26 are mounted, the lenses of the objectives being cut in such a manner as to enable their axes to be brought nearer to each other so that they are separated by the exact distance of the centres of the two images A, A^1—B, B^1, etc. An adjustment is effected by mounting each objective on a kind of double middle partition 27 with a hinge 28, the variable distance of which is operated by a micrometric screw 29 by means of a knob 30 with bevel pinions 31. Each of the objectives which may be mounted in such a manner that their axes shall be slightly convergent, has a special screen, one coloured in green, the other one in orange.

Owing to the arrangement, when projecting the positive film 2, the two images A, A^1—B, B^1—C, C^1, etc., are simultaneously projected on the screen, and are superposed so as to give one image only in natural colours.

RISE AND PROGRESS OF THE TECHNIQUE OF COLOUR PHOTOGRAPHY.

Under this title a demonstration illustrating the history of colour-processes was given by Mr. F. J. Stoakley, F.C.S., at the Camera Club on February 23. Mr. Stoakley showed a remarkable series of colour-slides as examples of both current and obsolete processes. The following note of the lecture is considered worthy of record on account of the simple manner in which the subject was treated.

The meeting was first reminded that colour is not a substance but a sensation, and in order that there should be colour there must be light. When light falls on an object it is seldom entirely reflected. More commonly a portion of the light is absorbed by the object, and the remainder is reflected to the eye, where it produces the sensation of colour. After a few words on well-known phenomena of the continuous spectrum, such as that produced when light is passed through a prism, and the reconstitution into white light by a second superimposed spectrum formed by a prism turned in the opposite direction, the speaker then asked the simple question, "Why does a red rose appear red?" As white light is composed of a mixture of the colours of the spectrum, and a red rose absorbs all the colours except the red rays (or, say, orange), it follows that the rose must appear red, for redness is the only sensation aroused in the eye. Now, suppose that a red rose be looked at through a piece of green glass, the rose no longer appears red, but, on the contrary, it appears black, i.e., colourless. What has happened here is that the green glass has absorbed the reflected red rays from the rose, and the net result is that between the red rose and the green glass all the colours of which the original white light was composed have been absorbed. A similar reasoning applies to the case of green grass. Green grass absorbs all the colours of incident light except green, and if we look at green grass through a red screen the latter absorbs the green rays so that the grass appears black. We know that in both cases the objects have not in reality changed in any respect, and consequently we may assume that the phenomenon of colour is due to absorption.

The earliest attempts to produce photographs in colour were made by what is called the "additive process," that is, the process which depends upon the addition of coloured lights to one another. At this point it is necessary to note that the colour resulting from the addition or mixture of coloured *lights* is quite different from the colour produced by a mixture of several *pigments* of the same colours as the lights. Thus, a mixture of a blue pigment with a yellow pigment is green, but the mixture of a blue light with a yellow light is practically white. The speaker had not with him the apparatus necessary to prove that all the colours of Nature can be simulated by varying the proportions of mixtures of the "primary" colours, and he merely recalled the fact that these three primary colours are red, green and blue-violet.

In 1861 Clerk Maxwell succeeded in reproducing photographically (and projecting on a screen) a piece of coloured tartan ribbon. He made three negatives, one through a red screen, the second through a green, and the third through a blue-violet (or rather a deep-blue) screen. From the negatives so obtained he prepared three positive transparencies, and these were projected on to the "collecting" screen by means of three lanterns, each transparency having its own "taking screen" in front of it, with the result that the colours of the tartan ribbon were approximately reproduced. Similar work on these lines was carried out by Von Hubl, F. E. Ives, etc. The beautiful and ingenious Ives' "Kromskop" gave stereoscopic reproductions in colour based on the principles of the Clerk Maxwell process, viz., the additive process.

The next great step was the development of the additive method so that a single plate could be used instead of the three hitherto employed. This was effected by preparing a plate in such a way that it was in reality an enormous number of tiny screens comprising the essential colour sensations. The tiny colour-screens were composed of regular rulings or patterns of the essential colours on the plate, but this method of tiny screens was further extended to plates with irregular markings. Hence the plates of this type can be grouped under two heads (*a*) and (*b*). (*a*) The Regular: exemplified by Joly's "ruled-line screen," the "Thames" (Finlay), the "Omnicolore" (Jougla), the "Dioptichrome" (Dufay), the Paget Process, etc., the tiny screens of which consist of coloured lines, squares or dots in various patterns in the three colours red, green, and blue-violet, all over the plate.

(*b*) The Irregular: exemplified by the Lumière Autochrome plate, which is prepared by dusting on to a tacky glass plate grains of potato starch which have been previously dyed red, green and blue-violet, and dried and mixed in the proper proportion of colour.

In both cases the screen part is varnished for protection and coated with a panchromatic emulsion. Since this emulsion is more sensitive to blue and violet rays of light than to orange and red it is necessary to use a compensating screen.

Mr. Stoakley showed examples of each screen and micro-photographs of the several screens were projected on to the lantern screen, as well as colour-photographs by the various screen processes. Attention was called to the great superiority of the "irregular" screen for depicting fine shades of colour, metallic surfaces, the sheen of birds' feathers, etc., and the physics of the phenomenon was described. The portrayal of black and white through colour-screens was also shown.

The last process described is that known as the "subtractive" method, as exemplified by the Sanger-Shepherd and its modifications, which have a wide application. Three negatives are made in succession through the red, green and blue-violet screens, and from each of the negatives, or "colour sensations," a positive is prepared. By chemical treatment (or dyeing) the positives are made in the complementary colours of their "taking screens." Thus the positive from the red sensation is made cyan-blue, that from the green sensation is made pink, and that from the blue-violet sensation is made yellow. Two of the positives are taken on gelatine films so that all the positives can be bound up together and projected or viewed by transmitted light so as to reproduce exactly the colour of the original.

The speaker showed a number of slides made by this process, and by means of partly made slides, i.e., slides with 1, 2 or 3, or 2 only, of the combinations of the colours, demonstrated the synthesis of the process and described in detail the precautions necessary to get the best results. The causes of failure or defects were also explained.

The preparation of colour-prints for book-plates and advertisement illustrations depended on making three negatives as above described, and from them blocks were made and inked up in the three complementary colours which were superposed on a white background.

No. 185. VOL. XVI. APRIL 7, 1922.

THE BRITISH JOURNAL OF PHOTOGRAPHY

MONTHLY SUPPLEMENT

ON

Colour Photography.

CONTENTS.

A CHRONOLOGY OF THE PHOTOCHROMOSCOPE.

It would seem desirable, in the interest of correct historical record, to give a summary of the *facts*, as evidenced by the literature available.

First, as to the invention of the word "photochromoscope." J. Francis[1] thus termed an instrument he had devised for examining lantern slides, which was exhibited at the Photographic Exhibition in 1879. This consisted of a tube with enlarging lens, a slot for the slide, a ground glass, and a flexible curtain with graded colours for tinting the picture; this curtain being adjustable by means of a knob. Incidentally it may be remarked that he wrote, claiming priority, because he thought that his idea was being "cribbed by a Yankee"; but the Yank, who was E. L. Wilson, the editor of "Wilson's Photographic Magazine," repudiated any such intention, and abandoned his projected patent.

As regards the instruments used for colour photography we again meet with the fact that Ducos du Hauron and Chas. Cros were the original inventors, and quite independently of one another, as they were of so many other ideas, which have since been patented and exploited by others, without any credit to these pioneers.

It is probably well known that du Hauron sent, in 1862, a paper to M. Lelut with a request that it be read before the Académie des Sciences, and that this paper was rejected; but was reprinted in 1897.[2] And here he described a photochromoscope, with figure, a rough sketch of which is reproduced. It is unnecessary to give in detail du Hauron's description, as its construction will be apparent to anyone conversant with such instruments. Suffice it to say, that the three mirrors, shown in continuous lines, are at right angles

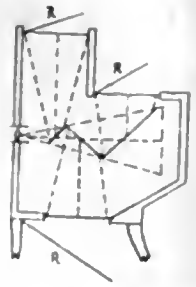


Fig. 1.—Du Hauron's 1862 Photochromoscope

to one another, and the paths of the rays from the three transparencies are shown by the broken lines, as is also the position of the compound image at the extreme right. R, R, R represent adjustable mirrors for illuminating the pictures. Du Hauron suggests that it is possible to modify the results by varying the colour of any positive, locally or entirely. Also that the instrument could be used for stereoscopic work by merely doubling the length of the apparatus so as to enable stereo transparencies to be used. Further, it can be says, possible to use only three single positives

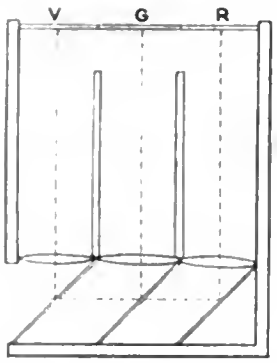


Fig. 2. Du Hauron's 1869 Photochromoscope.

with less perfection it is true (*avec moins de perfection il est vrai*), by arranging for the one eye to see the red and yellow proofs, and the other eye to see the blue. A method, which is physiologically unsound, but which was subsequently patented by Lumley, Barnard and Gowenlock, in the Kromaz, and by Nachet.

Again, in 1869, du Hauron[3] says, "if the images of the three proofs are projected on to a white surface by means of three lenses, placed in such a way that the three images will be exactly superimposed, there will appear on the screen a polychrome image, which is the faithful representation of Nature. To fuse the three proofs into one picture, one may replace the polyoramic apparatus with three lenses by an apparatus composed of three unsilvered glasses (*trois glaces sans tain*), placed one behind the other with respect to the eye of the observer, on each of which there will be by reflection a different picture. To avoid the doubling of each image from the two parallel faces of the corresponding glass, it is necessary to place between the pictures and the glass a convergent or divergent lens, the magnification of which should have the effect of placing the picture at such a distance that this doubling becomes imperceptible." No diagram of this instrument was given; but

1. B.J., 1880, Vol. 17, 36. Wilson and Henerman ran a photo material business, or stock house as it is called, in Philadelphia, and made a specialty of lantern slides. Wilson's "Lantern Tours of the World" were famous.

2. *La Triplice Photographique des Couleurs et de l'Imprimerie*, Paris, 1897, 449-464.

3. *Les Couleurs en Photographie, Solution du Problème*, Paris, 1869, 54, cf. L. Vidal, "Bull. Soc. Franc. Phot.," 1897, Vol. 44, 225, where he quotes Cros and du Hauron. Incidentally it may be noted that about this time a somewhat acrimonious paper discussion raged between Vidal and F. E. Ives as to the priority of the invention of these instruments, and it is not worth while to record all the ink spilt. In order to save space, translations only of the original passages are given by me.—E. J. W.

later, after recalling his previous, 1869, remarks, du Hauron says: "Here is moreover, a diagram which, still better than the preceding description, will explain all the simplicity of the construction, of which it treats." This I have roughly re-drawn, and it requires no explanation.

In 1874 another camera[5] was patented, which was later embodied in his English patent,[6] and the latter says:—"The rays coming from the subject to be reproduced are received upon a glass unsilvered with parallel faces inclined 45 deg., or thereabouts, in respect to the model and in respect to a first lens, towards which it reflects a part of the above-mentioned rays. The greater part of these rays traverse the first glass, and they are received by a second glass equally unsilvered and with parallel faces also inclined 45 deg., or thereabouts, in relation to the model and in relation to a second lens towards which it partially reflects the rays it receives. Lastly: the rays that this second glass allows to pass are received by a third lens either direct or by interposing a silvered or metallised glass, which reflects nearly all of them. The distance of this first glass to the first lens is equal, or nearly equal (slight discrepancies do not appreciably alter the results), to the sum of the distances of the first glass to the second, and of this latter to the second lens, and it will be equal also to the sum of the distances of the first glass to the third lens (or if a third glass is made use of it is equal to the sum of the distances of the first glass to the third glass *plus* that of that of that third glass to the third lens). In virtue of this arrangement the three images received by the three lenses are geometrically the same."

For reproducing near objects, it is pointed out that the doubling of the outlines of the objects from the thickness of the glasses can be easily remedied by interposing between the said apparatus and the model a magnifying glass, having the effect of placing the subject farther back.[7] The use of a concave lens near the sensitive plate is also described to flatten the field, in both patents the unequal sensitiveness of the plates to the green and violet is pointed out, and it is suggested that this may be adjusted by the use of two or more reflector glasses superimposed and in perfect contact, in front of the green-sensitive plate. But in the French patent it says: "This may be obtained, moreover, if desired, by a single glass of which the silvering (*l'etamage*=plating) may be partially removed, in such a way as to present regular alternation of large unsilvered spaces and smaller silvered spaces.[8]

4. *La Triplice Photographique*, 354-367.
5. Fr. Pat. 105,881, 1874. The full specification is given in *La Triplice Photographique*, 219.
6. Eng. Pat. 2,973, 1876; given in full B.J., 1877, Vol. 24, 152,163, 181, 212, 238, 249, 259; abst. ibid. 1907, Vol. 54 Col. Phot. Supp., Vol. 1, 6.
7. Du Hauron says, loc. cit. 222, that this magnifying glass is nothing more than a magnifier (bonnette d'approche) recently introduced for ordinary work.
8. This is, I believe, the first mention of partially silvered reflectors, later patented by many others, Ives, Lumière, Sanger-Shepherd, Comstock, Brewster, etc.

In 1885 another camera was patented[9] in which "three small mirrors were juxtaposed one against the other, not on the same plane, but in such a manner as to form three facets, differently inclined, but all inclined at 45 degrees with respect to a virtual plane, to which their backs were turned. This virtual plane being built vertically and the three facets being disposed in a triangle, the two facets at the lower part and the facet at the top reflected the same image, the two first ones into two horizontal cameras, where the sensitive plates were, consequently in a vertical position, and the third into a vertical camera where the sensitive surface formed the floor (*plafond*); the triad of the little mirrors occupied the centre of the system and each of them was inclined at 45 deg. with respect to the objective that corresponded to it."

"*Si defecteuse et si rudimentaire*," as the patentee admits this to have been, it gave him satisfactory results. He points out that the three small mirrors should be preferably of plated glass, metal mirrors, or, better still, glass with a perfectly polished silver coating, or they might be three small prisms with silvered hypothenuses. Presumably du Hauron distinguishes between mere "plated" glass, that is ordinary mirrors, and surface silvered glass, the former being mercury and foil treated.

Cros's idea of a photochromoscope is definite enough, though no figure is given, as he says:[10] "Print separately the three clichés on a sensitive paper or on glass—so as to have the three positives. Coat the positive obtained with the red frame with the same varnish which was used for the glass of the frame. The same for the other two positives, of which the first will be covered with yellow varnish, the second with blue varnish. This done, take two clean glasses. Mount on five independent supports, at the same height, the two white glasses and the three positives coloured as has already been described. Finally try to make coincide the images of two of the three positives formed in each of the transparent glasses with the third positive which one looks at direct through these glasses. It may be convenient to illuminate the positives by mirrors. One may also, by modifying the obliquity of the reflection of the transparent glasses, vary in every proportion the intensity of each virtual image. In repeating this experience, one will find the conditions of detail which will prove the best. These conditions being once fixed, one will deduce the principles of construction of an invariable and definitive apparatus which permits, with the three elementary proofs, of reconstituting by the eye the real picture with all its tints."

E. J. Wall, F.R.P.S.

(To be continued.)

9. Fr. Pat. 173,101, 1885; *La Triplice*, etc., 217.
10. *Solution du Problème de la Photographie des Couleurs*, "Les Mondes." Feb. 25, 1869; subsequently published in pamphlet form, Paris, 1869.

A VARIATION OF THE SCREEN-PLATE PROCESS.

[A recent patent specification, No. 175,373, in the name of Miss Florence M. Warner, who some years ago was associated in the Warner-Powrie process, proposes a variation of the separate method of making screen-plate colour transparencies. The exposure in the camera is made upon a panchromatic plate, the emulsion of which is coated upon a three-colour mosaic, preferably of parallel-line pattern. On development a negative in complementary colours is of course produced. From this negative a monochrome positive transparency is printed by daylight or artificial light upon a panchromatic plate, and the positive thus obtained bound up in register with a mosaic colour screen, similar to that used in taking the negative. It is obvious that in this process the panchromatic emulsion of the positive plate may require the use of a compensating filter for the purpose of bringing the printing light into adjustment with the colour-sensitiveness of the emulsion. Thus the process eliminates the use of a loose and separate taking screen at the cost of the necessity for this balance in making the positive transparency.]

The invention has for its object the production of transparent positive photographs in natural colours from a negative taken of a subject on a sensitive plate provided with a permanent colour screen having different coloured elements.

The method is for overcoming the difficulties of the separate and combined screen-plate processes, by which positive transparencies can be made in any number and in natural colours from a negative made on a screen plate having the sensitive emulsion on the screen plate itself.

According to the invention, positives in any number may be made from a negative taken on a sensitive plate having a permanent coloured screen of lines, dots, or figures, by making a monochrome positive from such a negative on a panchromatic plate, so as to produce a good black and white condition, if the positive is taken under what may be termed balanced conditions of light and emulsion. By "balanced conditions" is meant balancing or compensating the sensitiveness of the emulsion and the printing power of the light.

A negative is made on a plate produced by coating a screen plate having a recurring pattern as recurring parallel lines of the three primary colours, green, blue, and red, with a sensitive emulsion, the emulsion being placed directly on the colonred lined surface of the plate so that the screen is permanent, that is, the screen is not removed during the process of development. A screen having a pattern of parallel lines is preferred, though screens having other patterns of regular recurring elements may be used.

As shown in fig. 1, the subject chosen for illustration is a red

Fig. 1.

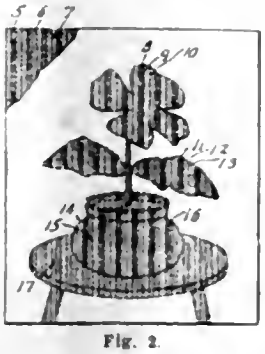


Fig. 2.

flower 1, with green leaves 2, in a blue pot 3, standing on a black table 4. An exposure of this subject is made on a screen plate having alternate parallel lines of red, marked 5, green, marked 6, and blue, marked 7. This exposure is made in a camera equipped with a compensating filter. This negative after exposure is developed and fixed in the usual manner, and there is produced a negative image in colours complementary to those of the subject. These colours are indicated by the lines; the black lines 8 are the lines through which the red lines of the screen have let pass the red light of the red flower 1 and exposed the sensitive coating of the plate. The emulsion over the green and blue lines 9 and 10 has been unacted on so that when the negative has been developed and fixed these lines will appear clear. The same action occurs for the green leaves, the silver emulsion over the green lines in this instance being exposed and being indicated by the blackened lines 11, the emulsion over the blue and red lines 12 and 13 being unexposed; and the same action has occurred in the negative of the bowl, the silver emulsion over the blue lines having been acted on and forming the black lines indicated at 16, the emulsion over the green and red lines 14 and 15 having been unacted on. None of the silver emulsion over the lines back of the black table of the plate has been acted on and the silver is unexposed, this condition being indicated by the lines 17.

From this negative a positive is printed on a plate having a panchromatic emulsion, so as to produce a monochrome having a good black and white condition, that is, in which a true black and white is obtained, and not a black or white tinged with colour. In printing this positive, any source of light may be employed. Preferably this would be an artificial white light, such as that of acetylene gas or the well-known nitrogen lamp. Where the printing is to be effected by such light, the emulsion of the plate will be of such character that it is equally sensitive to the green, blue, and red of the negative screen, and in such case the compensating filter may be omitted in the printing. If, however, the printing is to be effected by natural light, a compensating filter is used, this filter rendering the emulsion equally sensitive to the three colours of the screen, and where such filter is used no change in the emulsion is necessary.

This monochrome positive is then developed and fixed in the usual manner and with the usual developing and fixing agents. After developing and fixing, the monochrome positive appears as shown in fig. 3, the red flower appearing in lines 18 and 19, the lines 18 corresponding to the lines 8 of the negative of fig. 2, and the lines 19 corresponding to the lines 9 and 10 of negative of fig. 2; similarly the green leaves appear in lines 20 and 21, the lines 20 corresponding to the green lines 11 of the negative of fig. 2, and the lines 21 corresponding to lines 12 and 13 of the negative of fig. 2 similarly with the blue pot in which the lines 22 correspond to the lines 16 of the negative of fig. 2 and the lines 23 correspond to the lines 14 and 15 of the negative of fig. 2, and the table 24 is a black silver deposit covering all the lines as shown at 17 of fig. 2.

The positive plate is then superimposed in registered position with a colour screen similar to the screen through which the

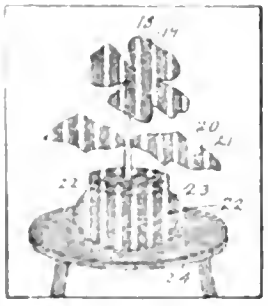


Fig. 3.

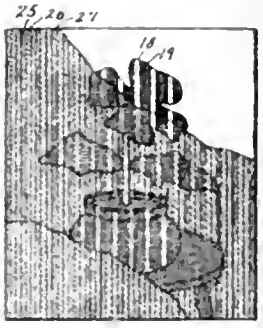


Fig. 4.

negative was taken, such as a lined screen having parallel lines 25, 26, and 27 of alternate red, green, and blue colours. The two plates are superimposed and adjusted with respect to each other and mounted together. When properly adjusted the subject photographed will appear as a transparency in its original colours, and this condition is illustrated in fig. 4. As shown in this figure the monochrome positive and the lined screen plate are so adjusted that the lines 18 of the red portion of the subject are superposed over the red lines 25 of the screen plate, the green lines 20 are superposed over the green lines 26 of the plate and the blue lines 22 are superposed over the blue lines 27 of the plate.

TRIADOCHROME THREE-COLOUR PRINTS BY TRANSFER AND CHEMICAL TONING.

[In the issue of this Supplement for February 3, we published a short account of the process of three-colour printing worked out by Mr. J. F. Shepherd and named by him Triadochrome. The full way to the particulars of the process are contained in the patent specification, No. 175,003, granted to J. F. Shepherd, and [illegible] Photography Ltd.]

This invention consists in improvements in or relating to colour photography, and refers particularly to those methods of obtaining subtractive three-colour prints wherein the three superimposed coloured images are prepared by two or more dissimilar methods. Examples of such methods of obtaining colour-prints which have been proposed are described in the Patents Nos. 1,937 of 1911 and 20,556 of 1912.

According to one feature of the present invention a method of three-colour photographic printing consists in superimposing two chemically toned photographic images and a pigment or dye image, the colours of the three images being those usual in subtractive methods of colour photography; and the colour of the pigment or dye image may be any one of the three.

By "chemically toned image" is meant a coloured image produced by chemical action on an image consisting of metallic silver which is thereby changed completely into a coloured compound;

and by "pigment or dye image" is meant a coloured image consisting of a pigment or dye only and does not include an image produced by chemically treating or replacing a silver image. An example of a chemically toned image is a blue-green image produced from an ordinary silver image by treating it first with an alkaline ferricyanide solution and subsequently with a ferric salt solution.

An example of a pigment or dye image is a colour carbon print, produced as is well known by the hardening action of light on bichromated gelatine impregnated with a pigment or dye. Another example is an imbibition image, produced by imbibition or absorption of a dye by a gelatine from a dyed printing-plate. Further, an image produced by mechanical printing in colour from a half-tone block is also regarded as within the scope of the term "pigment or dye image."

As an example of a method according to the invention, there may be superimposed in register on a positive magenta carbon print, two bromide prints chemically toned respectively to the colours required for the blue-green and yellow positive images. If desired, the colour-tone of the magenta image may be modified by the immersion of the positive magenta carbon print in a solution of flavazine or naphthol yellow, or a combination of flavazine and naphthol yellow. Moreover, the blue-green and yellow positive prints are treated with toning solutions which can preferably be modified to vary the colour-tone of the resulting print.

According to one method of carrying out the invention one of the superimposed bromide prints is stripped, during the process of superimposition, from its backing, and the other bromide print is superimposed as an outside element of the composite photograph, the original paper or equivalent backing of that print remaining as the backing for the composite photograph.

Another feature of the invention comprises a method of three-colour photographic printing which consists in superimposing in register two chemically toned colour positive prints and impressing the third image—that is, the pigment or dye image—in register on either one or the other of the prints before or after superimposition by means of a dyed printing plate.

By the term "printing plate" is meant any surface so formed or produced as to retain pigment or dye to different extents at different parts thereof and to transfer the pigment or dye to the surface upon which it is to be impressed. Thus, for example, such a printing plate may be a bichromated gelatine surface exposed through a photographic negative as used in the so-called "imbibition" method; or it may be a half-tone printing block of the ordinary kind.

Some preferred methods of carrying the invention into effect will now be described in detail by way of example only.

In the first method now to be described three-colour record negatives of the object are obtained in the manner well understood in three-colour photography. The positive print, of which the image is to be a magenta or minus green colour, is obtained from the appropriate negative by printing on a magenta carbon tissue. Positives are printed from the other two negatives as black and white prints on bromide paper, conveniently of the kind which is sold and known as "Transferotype" paper. Such paper is a bromide emulsion paper specially prepared so as to be capable, after printing, of having the backing paper stripped off from the emulsion during the transfer process.

The black and white bromide prints are chemically toned respectively blue-green and yellow, or, in other words, minus red and minus blue respectively. For the "blue green" print the following toning solution is preferred:—

Potassium ferricyanide	½ oz.
Ammonium citrate of iron	½ oz.
Citric acid	1 oz.
Water	60 ozs.

In practice the bromide print for the blue-green image is preferably transferred in its black and white condition on to the magenta print and after being so transferred is toned to the blue-green colour with the solution above described. The toning of the blue-green image does not affect the magenta image during the process of toning. For this purpose the black and white bromide print is superimposed on the magenta carbon image and allowed to set for about one hour, after which period the paper backing is stripped off conveniently by soaking in water at a temperature of about 85 deg. F. The backing is found then to be easily removable and the blue-green toning is effected after the backing has been stripped off.

The yellow print is preferably toned before superimposition, and a solution for toning this print is prepared preferably as follows:—

STOCK SOLUTIONS.

(1) Mercuric iodide, 5 per cent. solution; (2) Potassium iodide, 5 per cent. solution; (3) Potassium ferricyanide, 3 per cent. solution. admixed with ammonium bromide, 3 per cent. in equal proportions.

To make a yellow toning solution for use—

3 ozs. of No. (1) stock solution.

4 ozs of No. (2) stock solution.

8 ozs. of No. (3) stock solution are admixed with 10 per cent. water.

After toning the print should be washed well for about 20 minutes.

The carbon print is first transferred on to a glass, celluloid or other transparent support and, in the manner described, the other two prints are superimposed in register thereon in succession. The last print to be superimposed does not have its backing stripped from it, but the composite print is stripped from the transparent mount leaving the backing of the last applied print as the backing of the finished photograph.

Alternatively the backing of the last applied print may be stripped off and the coloured photograph used as a transparency. It is immaterial in which order the prints are superimposed, but if the paper backing of one of the prints is to remain as the backing of the finished photograph, that paper backing should be the original backing of one of the bromide prints.

The process adapts itself to reproduction on a large scale of coloured prints from the one set of negatives, but it is found that if the prints are not to be superimposed immediately surplus moisture should be blotted off at least from the bromide prints and the prints allowed to dry as rapidly as possible. These prints can then be laid aside until they are required for making up the composite picture, when they will be soaked in water before being transferred and superimposed one on the other.

In another method of colour printing according to this invention blue-green and yellow toned bromide prints are prepared in the manner described above. The blue-green print is conveniently transferred to a celluloid or other transparent support and its backing stripped off. The yellow print is then superimposed in register over the blue-green print, is squeegeed thereon and when dry the prints are pulled off from the support and remain on the paper backing of the yellow print.

The magenta print is obtained by making a black and white positive transparency from the green record negative and from the positive so produced a print is made on a bichromated gelatine film which is transferred to any desired backing and soaked, either before or after transference, in a magenta dye. As is well known, this bichromated gelatine film absorbs dye more readily in those parts which have not been exposed to light, and consequently when the two-colour print already made is squeegeed into contact and in register with the dye-soaked film, a magenta dye image will be transferred to the print by imbibition, thus completing the three-colour print.

It is immaterial to the invention, in what order the prints are superimposed or impressed provided that any one of the three-colour images which is opaque in character is next to the paper or other backing.

PRACTICAL COLOUR PHOTOGRAPHY.—The American Photographic Publishing Co., 428, Newbury Street, Boston, Mass., announce for early publication a comprehensive treatise on colour photography by Mr. E. J. Wall under the above title. The work is to be divided into nineteen chapters dealing with principles of colour, sensitive plates and colour filters, cameras, subtractive printing processes, colour screen-plates, the Lippmann process, two-colour and other processes as well as with colour cinematograhy. The price of the work has not yet been definitely fixed, but will probably be three dollars. Orders will be accepted in advance of publication at the special price of 2 dols. 50.

No. 186. VOL. XVI. MAY 5, 1922.

THE BRITISH JOURNAL OF PHOTOGRAPHY

MONTHLY SUPPLEMENT

ON

Colour Photography.

CONTENTS.

SOME CAUSES OF FAILURE IN AUTOCHROME WORK.

The Autochrome process is, I think, rightly regarded as among the simplest of the present-day methods of producing photographs in natural colours, and though the manufacturers of the Autochrome plate give specific and minute directions for their manipulation, many photographers, even after a fairly lengthy experience, do not obtain results as good as the process is capable of giving. Hence some notes on causes of possible failures may perhaps be of use to many workers, who may not have obtained strikingly beautiful results.

One of the most prolific causes of failure in securing Autochrome transparencies pleasing as regards brilliancy and rendering of colour can be traced to the fact that many exposures are made under dull lighting conditions. The light in this country, even at its brightest, is none too good for colour photography. Under dull lighting conditions, while the plate may render the colours up to a certain degree, the visual brightness that we associate with the subject is lacking: the transparency looks dull and spiritless. It is not generally realised by those who have not had a grounding in the scientific principles of colour that the brilliance of the colouring in any object depends almost entirely upon the strength of the light illuminating it. If, for example, we examine a deeply coloured orange in a shadowed corner of a room we shall be sensitive of its colour in only a slight degree. If we take the same orange to a more brightly lit part of the room near a window we shall be impressed by its colour still more; while if we take the same orange into bright sunlight its colouring will be more brilliant still. I would go so far as to say that the orange when examined in the dark corner of the room looked almost *colourless*, and probably the impression as to its colour was a *mental* rather than a *visual* one. The colour of the orange was known, and this fact influenced to a great extent the idea formed of its intensity of colouring. By way of emphasising this point still further, if the orange is placed upon a table near a window, the light coming from one main direction, it will readily be observed that the colour is more intense where the light is strongest, while on the extreme shadow there is little or no colour visible. It is there of course, but the light has not brought it out. Now a colour photograph taken of this orange would be unsatisfactory. There would be a small area of colour upon the orange, the rest being in shadow, and, reflecting no coloured light-rays would be seemingly inaccurate. The picture would be accurate, but as a colour photograph distinctly unpleasing. If the Autochrome worker can only grasp this point fully at the outset he will go far to avoid one of the most prolific sources of failure. I do not mean to infer that it is not possible to make quite good Autochromes under dull lighting conditions, but rather that the best results are certainly only to be obtained under the most brilliant lightings. We are so used to thinking of the brilliance of the colours when viewed under sunlight that we do not fully realise what a great difference an absence of sunlight really makes.

Further, it seems that the very weak light-rays emanating from shadow detail cannot pass through the screen of an Autochrome plate unless a very full exposure can be given, a fact contributing towards lack of colour in the deep shadows. In this respect the average Autochrome rendering of a sunset is often disappointing. There is a central spot of colour in an area of black shadow, which, though satisfactory from the scientific point of view, fails to please as a picture. I would most strongly emphasise that all exposures should, as far as possible, be made out of doors, even when taking Autochromes of flower, fruit and still-life studies, for unlike monochrome work, where we need shadow and tone, the Autochrome needs colour, and the strongest possible even lighting is required to bring this out and avoid contrasts.

The question of exposure, where so many workers go wrong, is best settled by a careful calculation with an actinometer that makes an actual test of the light, the indicated exposure being very accurately timed. Ten per cent. of the time may be added with advantage if the light is dull or with a view to allowing for any slight lessening of the speed of the plate after its manufacture. Many Autochrome transparencies that I have seen bear abundant evidence of the fact that the question of the exact exposure has not had the amount of attention necessary.

As regards dark-room manipulation, the safe-light recommended by the makers should always be used; and this requires to be most carefully employed if it is not to affect the colour of the Autochrome plate. I have seen many Autochromes possessing a greenish blue tint that has very obviously resulted from too close an inspection by the Virida light. This should be kept at least 4 feet from the plate, the latter always being shielded from direct rays.

I recommend that whenever the exposure is known to be correct the plates should be developed in a tank by a reliable time and temperature system. This will produce far better results as a general rule than the old method of judging the

process of development by inspection. In fact, even after a considerable experience this is no easy matter, and incorrect development may be regarded as a very prolific cause of failures, even when the exposure was correct. Using the highly concentrated solutions recommended for Autochrome plates, the image appears very rapidly, and the plate quickly begins to blacken over. Owing to this fact and the necessarily weak dark-room light, the degree that development has progressed is not easy to judge. Even if tank development is not adopted, the time and temperature system should be employed. The chief danger is under-development in the first bath. If this happens, the first image, being weak, leaves too much unreduced silver after reversal, with the result that after the second development the Autochrome is dull, opaque and lacking in brilliancy of colour.

Trouble sometimes arises from a lack of understanding upon the part of the photographer that an Autochrome film is far more delicate than an ordinary dry plate, and will not stand rough washing; prolonged immersion, in solutions, or solutions of abnormal strength, handling with hot fingers, etc., without risk of mechanical damage. The film must not be touched while wet with the fingers. If proper cleanliness of solutions, dishes, etc., is observed there should be no need for this.

An otherwise good Autochrome may be spoiled through needed after-treatment being postponed until the plate has dried. If an Autochrome transparency, after the second development, is found to need intensification or reduction, this should be proceeded with at once, for if the plate has once been dried re-wetting is almost certain to produce green spots, if not worse. After-treatment which involves prolonged immersion of the transparency is to be avoided if possible, but my own experience has been that if strict cleanliness is observed, the plate handled as little as possible, and immersed for as short a time as is consistent with the effective action of any solution at normal strength, few failures will occur.

Finally, some Autochrome transparencies, after coming from the second development, are of an unpleasing brownish tint which detracts from the beauty of the colouring. If this is found to be present the reversing bath may be diluted to about one in forty, and the Autochrome, after well washing, immersed in this bath. Great care must be taken not to leave the plate in the solution too long: half a minute at the outside is sufficient to clear the image; longer action may greatly reduce the image. Though not generally regarded as essential, most Autochromes are the better for the clearing bath, especially if the colours are inclined to be dull. The plate should be washed for about four minutes afterwards.

At the present time most of the early difficulties have been satisfactorily overcome, and the production of perfect colour pictures is a certain and simple matter. The makers point out that owing to the extreme delicacy black spots do sometimes appear in the emulsion, but in my own case it is rare to find them, and as a general rule if a plate gives an unsatisfactory result the worker himself is usually to blame.

ROBERT M. FANSTONE.

A CHRONOLOGY OF THE PHOTOCHROMOSCOPE.

(*Concluded from Page* 14, *Supplement.*)

Of course it may be said that this description is so vague that it cannot be advanced, from a patent standpoint, to anticipate anything; but Cros, later, was more explicit, and in a communication to the Société Française de Photographie[11] he describes in detail a "chromometre," which admits of no cavilling. It is unnecessary to reprint his preliminary observations in full, and we can summarise them by saying that he recognised the fundamental triad, "already published by M. Helmholtz," of red, green and violet;

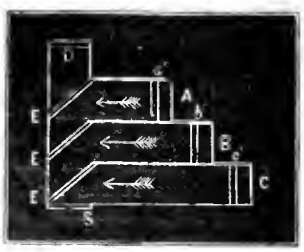


Fig. 3.—Cros' 1879 Chromometer.
A. B. C. Positive images on glass obtained with different coloured rays. *a' b' c'*. Grooves for troughs of coloured liquids to be placed in conjunction therewith. D. Ground glass. E E E. Transparent plate glass screens upon which are projected respectively the images of A B C. S. Spectator, who sees the three images of different colours coalesced into one image.

that he used glass troughs filled with a red solution of cobalt chloride, a yellow solution of neutral chromate of potash and a blue solution of copper nitrate, and combined them to obtain the correct triad. He then says: "For a more handy presentation before the Photographic Society of France I have replaced these systems of troughs by glasses coloured respectively violet, green and orange by means of collodion tinted with aniline colours. I have called this instrument a 'chromometre,' because it can serve to distinguish the colours one from the other by numerical denomination. In fact to vary indefinitely the tint resulting from the visible field, it suffices to vary the force or amount of lighting of each opening. I propose to employ the method of Arago by polarised light, but I cannot afford the construction of such costly apparatus. I must content myself with the instrument I have already had constructed, and vary the lighting by the interposition of thicknesses, more or less numerous, of transparent paper. One of the most curious applications of the chromometer is the following:—I obtain three negatives reproduced from any coloured picture—the first negative through a green, the second through a violet, and the third through an orange medium. The media are, again, the parallel-sided troughs of plate-glass containing standard coloured solutions. I may here remark in passing, that the inequality of actinism of these different lights is completely compensated by various organic substances with which I impregnate the sensitive plates. The negatives obtained are formed of reduced silver-like ordinary negatives. I obtain the black positives from these negatives, and I place each of these positives in the chromometer before the same medium of the same colour as that which served to obtain the corresponding negative. I make the three reflections to coincide, and the resulting image is that of the coloured model picture when the force of the three illuminations has been properly arranged."

It is evident from the above that we have the fundamental ideas of all subsequent photochromoscopes, and anticipation of several patented details.

Later Instruments.

Turning to modern instruments, if one can call modern those which are in some cases more than a quarter of a century old, the Patents Chronology of the "B. J." of 1907, Vol. 54, gives an

11. *Compt. Rend.*, 1879, Vol. *88*, I., 121; Bull. Soc. Franç. Phot., Vol. *26*, 23; Phot. Times, 1879, Vol. *9*, 186; B.J., 1879, Vol. *26*, 29; also described with similar figure in Phila. Phot., 1879, Vol. *16*, 90, by E. Stebbing, who was the French correspondent of this journal. Ives' patent for a three-step chromoscope is U.S. Pat. 531,040, 1894; corresponding Eng. Pat. 2,305, 1895.

abstract of the English patents; it is unnecessary, therefore, to repeat these, and only such additional references will be given with regard to the same as may round out the information, and the page number refers to the said chronology. But there are a few additional instruments, which can be interpolated by anyone interested in the same.

A. H. Cros, p. 6, also Fr. Pat. F. E. Ives, p. 15, same as U.S. Pat. 475,084 and Fr. Pat. 222,121, 1892.

C. Zink[12] also made a photochromoscope, although apparently it was not patented, and H. Krone gives the following data:—In the spring of 1893 Carl Zink, a photographer of Gotha, without knowing the photo- or heliochromoscope of Ives, constructed an apparatus which could be used for the same purpose, which he called a "photopolychromoskop," and which on account of the greater simplicity in its arrangement appears capable of acting as Ives' apparatus. In the exhibition of the 23rd Convention of the Deutscher Photographenvereins in August, 1894, at Frankfurt a/M., Zink exhibited for the first time an example of his photopolychromoscope, and, after testing, it was awarded the silver medal by the prize committee of the Convention. It is again unnecessary to enter into the details of construction, as this is clear from the accompanying diagram, a copy of that given by Krone. It will be sufficient to state that the filters V, G, R represent the violet, green and red respectively, and that 3 was a silvered mirror, the other two being plain glasses; and the eye E saw the composite image at I. It is also suggested that the instrument might be used as a camera, by inserting dark slides in the three steps, and that the green filter should be replaced by a yellow one. Further, that it might be used for projection by fitting it with three condensers and three small arc lamps; that it had the advantage that only one objective was used and there was no doubling of the outlines.

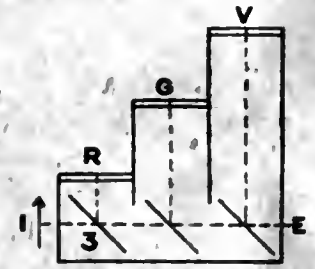


Fig. 4.—Zink's Photopolychromoskop.

C. Nachet[13] constructed several instruments; a stereophotochromoscope, fig. 5, and two of the positives were placed opposite the lenses, whilst the third, the green, was placed at the bottom of the instrument, its image being combined with either the red or blue by the platinised mirror. Niewenglowski states that Nachet obtained the idea for his instruments from Vidal's lectures at the Conservatoire des Arts et Métiers in 1891. Nachet[14] also made two cameras, figs. 6 and 7, and it will be noted that the latter is practically the same idea as White's camera of 1896, dealt with by Commander Rendall.

Niewenglowski[15] conceived the idea of increasing the usefulness of Nachet's stereo instrument by fitting it with analysers and polarisers, fig. 8, in which P is a pile of glass plates and N the Nicol prism or another pile of glass. Variations of colouring were thus obtainable by merely rotating the Nicol; the date of this must be 1894 or early 1895.

Ducos du Hauron[16] designed two cameras, one, fig. 9, was for one plate and was fitted with two transparent reflectors at an angle of 55 deg. to the optical axis, which reflected the rays to the three silvered mirrors M, M, M, and thus gave equal optical paths for the three images. In the other type the advantage of a single plate was sacrificed to compactness, fig. 10, and here two transparent mirrors at right angles were used, the first face reflecting the rays to the silvered mirror M, thus also equalising the paths. These instruments were called "chromographoscopes" and could be used as cameras as well as chromoscopes for viewing the results.

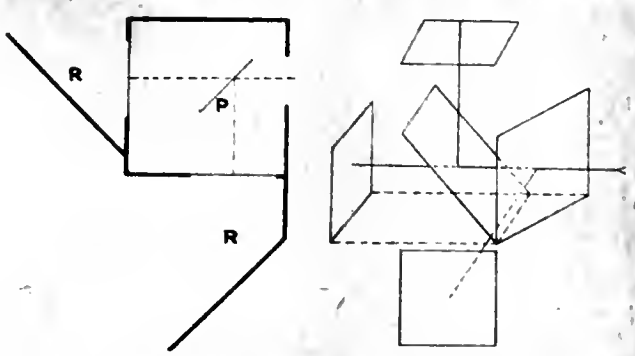


Fig. 5.—Nachet's Stereochromoscope. Fig. 6.—Nachet's Camera.

Ives, p. 16, same as U.S. Pat. 546,889, 1895; and p. 24, same as U.S. Pat. 531,040, 1894. He also patented[17] the insertion of a second plate of glass between the transparencies and reflectors to correct distortion, and claimed wedge-shaped reflectors. In a later patent[18] a camera is claimed in which the images are obtained on one plate by means of six reflectors, and tilting the camera to an angle of 45 deg. by means of a block of wood.

Du Hauron, p. 56, this camera was called the "melanochromoscope," and corresponds with U.S. Pat. 686,897, 1901, and Fr. Pat. 288,870, 1899.

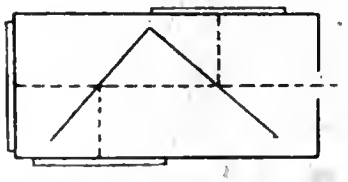


Fig. 7.—Nachet's Camera.

Ives[19] used three primary parallel reflectors one behind the other, and three reflecting prisms in front of three lenses; the camera obviously having to be angled as regards the subject; the plate being at an angle of 45 to the axial ray of the primary reflectors, and the prisms at an angle of 67.5 deg. to the said axial ray.

Selle[20] patented a camera and chromoscope, in which two central mirrors at right angles to one another reflected the rays to secondary silvered mirrors above and below; the central optical path being equalised by an inserted lens.

Ives[21] used a primary reflector at an angle of 45 to the incident ray, and behind this two right-angled prisms with their bases cemented in contact, this contact surface being either thinly silvered or with opaque metal reflecting surfaces broken into lines, dashes, dots, etc. The images were received by three lenses for three separate cameras placed on three sides of a square.

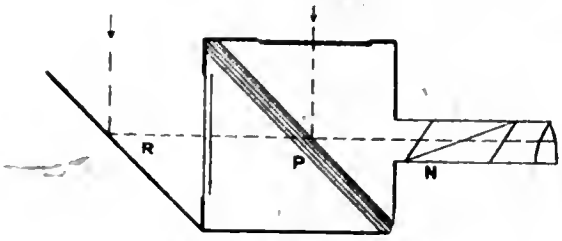


Fig. 8.—Niewenglowski's Chromoscope.

12. D. Phot. Ztg., 1893, 67; 1899, 271; Phot. Rund., 1894, 3861 Vie Sci., 1909, 94; H. Krone, *Die Darstellung der natürlichen Farben*, Weimar, 1894, 112. Krone referred to as Ives instrument with six internal and one external mirror and the images arranged in trefoil pattern on the plate, or one with four internal mirrors and trefoil pattern images.
13. Fr. Pat. 237,394, 1894; Mon. Phot., 1894, 135; Phot. Korr., 1894, Vol 31, 533; Bull. Soc. Franç. Phot., 1894, Vol. 41, 197; 1897, Vol. 44, 121; C. L. Rockert, *La Photographie des Couleurs*, Paris, 1900, 121; abst. "Phot. J.," 1898, Vol. 38, 340.
14. Bull. Soc. Franc. Phot., 1896, Vol. 42, 564; 1896, 312.
15. *Les Couleurs et la Photographie*, by G. H. Niewenglowski and A. Renault, Paris, 1896, 361.
16. C. L. Rockert, loc. cit., 169; *Bull. Soc. d'Encourag.*, 1899, Vol 98, 368.
17. U.S. Pat. 635,263, 1899.
18. U.S. Pat. 666,712, 1900.
19. U.S. Pat. 668,989, 1901.
20. Eng. Pat. 12,514; Fr. Pat. 322,840, 1903. This was very similar to Eng. Pat. 13,666, 1899; abst. Col. Phot. Supp., 63. Ger. Pat. 120,982, 1899, corresponds to this last patent.
21. U.S. Pat. 703,929, 1902. Lined silvered prisms were patented by Sanger-Shepherd, Eng. Pat. 10,992, 1902.

Krayn[23] introduced a two-step chromoscope with adjustable mirrors externally to vary the illumination of the pictures. He also[23] patented the linking together of the transparencies so that they would automatically fall into position on the chromoscope. Also, he patented[24] the adjustment of the reflectors in a two-step instrument by fastening them rigidly into a frame that slid along the base of the instrument.

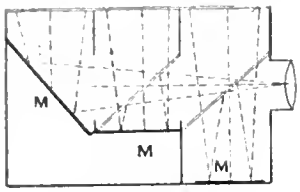


Fig. 9.—Du Hauron's Chromographoscope.

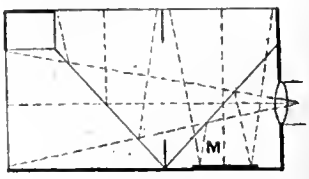


Fig. 10.—Du Hauron's Chromographoscope.

Ives[25] patented the use of bent springs engaging with the ends or sides of the reflectors to alter their figure.

This seems a convenient point to close up. It would be possible to include later forms, but these have been dealt with almost entirely in the Colour Supplement of the "B. J." since 1907. I have refrained from commenting on the obvious similarities of many of the ideas, as it would probably lead to needless discussion, and anyone interested in the subject can draw his own conclusions, and refer to the original sources if thought desirable.

E. J. Wall, F.R.P.S.

22. Ger. Pat. 115,377, 1898; *Eder's Jahrbuch*, 1901, 544; B.J., 1900, Vol. 47, 40.
23. Ger. Pat. 113,341, 1899.
24. Ger. Pat. 117,239, 1899.
25. U.S. Pat. 622,480, 1899; also patented by A. Strauss-Collin, Ger. Pat. 102,206, 1898.

REFRACTION COLOUR SCREEN-PLATES.

The following is the process described by M. Albert Keller-Dorian, of Mulhouse, Alsace, France, in a patent specification No. 158,511, applied for under the International Convention on January 21, 1920:—

It is known that total reflection from the inner face of a refracting medium can take place only when the said face is separated from a medium of the same refractive index, by a distance equal at least to one-quarter of the wave length. It follows that if at the back of the reflecting face a surface is arranged of the same refractive index, the distance of which increases from zero to the greatest wave length of the visible spectrum, the following effects are obtained:—

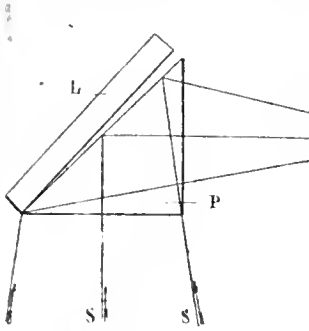


Fig. 1.

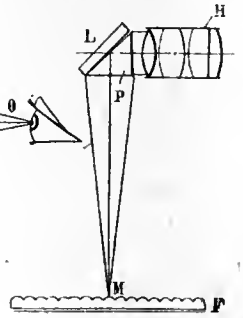


Fig. 2.

(1) At the points where the distance is less than one-quarter of the length of the smallest visible wave, no reflection will take place, and an impression of black will be produced;

(2) Beginning from the point where the distance becomes greater than the said minimum, the colours of the spectrum will be seen to succeed each other from violet to red;

(3) Finally, if the distance increases beyond the quantity required for reflecting the red rays, a second spectrum (spectrum of the second order) will be seen to succeed the first one, and so on, until the colours merge into white light.

According to the invention, apparatus producing these phenomena is used for the polychrome selection required in certain colour photography processes, namely, in those which are based on the use of sensitised surfaces mounted on a substratum provided with microscopic refracting elements.

This process is based on obtaining, on the sensitised layer, as many elementary images of the disc of the camera lens as there are microscopic refracting elements in the substratum of the sensitised layer. In order that the process should result in a polychrome selection of the radiations emanating from the object, the radiations of different colours must pass through the camera lens at different points. In the Berthon process, the disc of the camera lens is covered by suitably arranged three-colour selection screens. This device has the drawback of using screens which are necessarily arbitrary in colour and which falsify the natural colours.

The present invention consists in the combination with a sensitised plate having microscopic refracting surfaces and a camera lens, of a reflecting device comprising relatively inclined surfaces for the purpose of producing interference, the surfaces being located between the lens and the plate.

Fig. 1 shows an arrangement of the apparatus. At P is a total reflection prism (it could be replaced by a plate with parallel faces, but this would result in doubling the image). At L is an optically flat plate located a very small angle with the hypotenuse of the prism. From the point of observation O, the colours of the spectrum will be seen in steps from below upwards, with the plate L inclined, as shown in drawing, and assuming that the light admitted at S S S is ordinary white light.

Fig. 2 shows the arrangement of the same prism P with the plate L, at the back of a camera lens H. In the focal plane is arranged a sensitised plate F with microscopic refracting elements. From any point M of the layer F the disc of the camera lens will be seen in colours reflected by the device P L, assuming, of course, that the lens transmits white light to the point M. If the light transmitted is a monochromatic one, only the portion of the lens corresponding to the reflection of the said colour will appear luminous. If the light is a complex polychrome light, the lens will appear in the form of coloured bands corresponding to the spectrum of the light in question. In fine, each microscopic refracting element of the sensitised plate will register a spectro-photograph of the radiations striking it. Chromatic analysis will thus be brought about independently of any arbitrary factor, and merely owing to the properties of the light itself.

It must be pointed out that the device specified is not necessarily constituted by two flat plates or by a prism and a flat plate. The plate can be very slightly convex, and touch the hypotenuse face of the prism in its centre. In this case the colours are arranged concentrically about the black point. They are Newton rings in their original form.

The reflection device above described may be replaced by a reflection device having multiple layers of air similar to that employed in Lippmann's interference spectrum.

Messrs. Routledge announce that a revised edition of the textbook, "Photography in Colours," by Dr. G. Lindsay Johnson, will be published during the present month. The price will be about 6s. net.

Defective Colour-Perception.—A medical man writing in one of the evening papers on the difficulty some people experience in distinguishing colours says:—"One form of defective colour-perception is due to excessive smoking. It is known in pathology as *Tobacco Amblyopia*, and is caused by toxic substances, more particularly tobacco," he pointed out. "It is brought about by disease of the optic nerve, and unlike normal or physiological deficiency, responds to treatment. An over-use of tobacco, aided by mental depression and a low state of health, is the most general cause."

And further: "Some pairs of eyes have secrets between themselves—colour-blindness in one eye. While the right eye may see red as red, the left sees it as black. I have known victims of colour-blindness describe pink silk as sky blue, and scarlet berries as green. Colour-blindness is not generally the outcome of disease, but is usually hereditary. Sometimes, however, like gout, it skips a generation. Patients are super-sensitive about it. There have been many cases where veterans of 70 have hidden colour-blindness from their friends all their lives."

No. 187. VOL. XVI. JUNE 2, 1922.

THE BRITISH JOURNAL OF PHOTOGRAPHY

MONTHLY SUPPLEMENT

ON

Colour Photography.

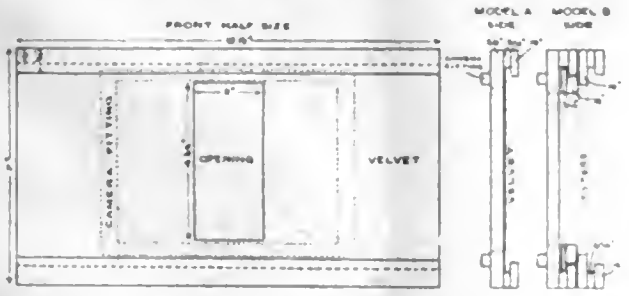
CONTENTS.

THREE-COLOUR REPEATING BACKS.

Although colour photography has been making fair progress during the last few years as regards the number of photographers taking it up, many have not done so owing to the greater expense as compared with monochrome. This is especially so with three-colour work, for three plates to each exposure soon runs away with the money, and when making a beginning with any process mistakes often occur.

When I started three-colour work myself I found it pretty costly, for an error in one plate meant the scrapping of three, so I looked round for some means to lessen the cost until I became more efficient. To that end I made myself a repeating back to fit my half-plate camera, so that I could make the three exposures on one half-plate. Although not very elaborate or showy it answered my purpose, and I took a considerable number of successful photographs with it.

The materials required are a strip of black velvet or plush, 13 in. by 7 in. One piece of wood 12½ in. by 7 in. by ⅞ in. (three-ply is the best for this); two pieces of wood.



12½ by ½ in. by 3-16 in., and two pieces 12½ in. by ⅞ in by ¼ in. The frame of an old dark slide belonging to the camera to be used will also be wanted, but if no such thing is at hand a fitting must be made so as to attach the back to the camera.

Cut an opening 2 in. by 4½ in. in the centre of the large piece of wood (see diagram), and then glue the piece of velvet, making sure it is perfectly smooth over the surface, turning the two ends over.

When dry, the velvet should be cut out at the opening. The frame of the dark slide or fitting should be both glued and screwed on to the other side of the board so that the hole is central.

The strips of wood should now be fitted on top of the velvet: the narrow strips first and then the wider pieces. Glue them first and then pass screws right through.

The narrow pieces of wood should be rubbed down to the thickness of the rebate on the dark slide intended to be used, and so fixed on the board that the dark slide lies comfortably between them. The top pieces are adjusted so as to hold the slide in place, but allow of free movement.

A mark should be cut in the top strip at the point where the centre of the plate is central with the opening. A thin piece of wood may be glued along one end to prevent the slide from accidentally overrunning the edge. A small catch on the other end to hold the slide while the shutter is being drawn completes the apparatus.

When the dark slide is just inserted in the repeating back the first third of the plate will be exposed. When pushed along to the mark the second third, and, at the farthest end, the final third will be uncovered. This will be found quite useful, and is intended to be used in conjunction with colour filters on the lens.

A form which carries the filters just in front of the plate can be made with very little more trouble. Make just as for the first form, but omit the velvet. Then make a carrier for the filters as follows:—The wood wanted will be one piece each, 8 in. by 6 in. by 3-16 in., 8 in. by 5½ in. by ¼ in., and 8 in. by 7 in. by ¼ in. Two pieces 8 in. by ½ in. by 3-16 in., and two pieces 8 in. by ¾ in. by ¼ in.

In the 7-in. pieces a half-plate opening is cut, in the other two the opening should be about ⅛ in. smaller all round. These three are glued together as follows:—The 6-in. piece, then the 5½ in. and then the 7 in., the first two so that the edges of the opening are level, the top piece so that a ¼-in. ledge is left all round for the screens to rest on. They should have a screw passed through at each corner. A shallow groove is cut right along the two narrow ends on each side about ⅜ in. wide, and narrow strips of velvet or plush glued in firmly to form light-traps. The strips of wood are glued along the edges of the wide piece as in the first model. This carrier is inserted in the groove in the repeating back and strips of wood fixed so that it will not come out. The screens are fixed in position in the carrier either by small metal clips or by strips of lantern binding glued along the edge.

To make sure that no stray light reaches the other portions of the plate while one is being exposed, fix a thin strip of wood along each side of the opening, so that they just touch

the face of the screens. A coat of dead black should be given to all inside parts of the carrier.

The best form of filters for the last model can very easily be made. Obtain tri-colour gelatine film from the plate manufacturers, size 4¼ in. by 2 in., and fix between two half-plate pieces of glass, either by simply binding with lantern-slide binding or with Canada balsam, but this last is not really required in so small a size.

Of course, a good woodworker would get the same result by different means, but, as set out, any man that can use a few ordinary tools will have no difficulty in getting a good result.

JOHN C. ARCH.

THE DISPLAY OF SCREEN-PLATE TRANSPARENCIES.

At the present time, doubtless for reasons of economy, most colour photographers working the screen-plate processes do so in the smaller sizes, such as 3½ × 2½ or ¼-plate. In course of time, as the collection grows, the worker finds it more or less of a problem how to display the transparencies to the best advantage.

One of the chief difficulties in showing a collection of colour transparencies to the best advantage is due to the fact that there is too much light in the ordinary domestic apartment to admit of the fullest impression being gathered of the brilliance and quality of the colours. Let the colour photographer block up a small window somewhere in the house temporarily while the sun is shining upon that side of it on a bright day, thus darkening the apartment. Then let the worker cut out a rectangle in the blocking medium the exact size of his colour photographs; and view the picture under these conditions. He will learn a number of useful things, and will most certainly find that a good colour transparency is a very beautiful thing indeed, and also he *may* gain an enhanced idea of the qualities of some of his own productions. Still, it is not necessary to have a darkened room in order to look at a collection of Autochromes. Apart from this factor of prime importance, the light behind the transparencies should be white, strong daylight being, of course, the ideal. When the light is yellow or weak, the best effects in the colour pictures will not be seen satisfactorily, while, upon a dull, winter afternoon, very little colour can be seen even in the best of transparencies.

Next to daylight, white artificial light may be employed with satisfactory results; both electric light and incandescent gas have advantages as regards uniformity, though with these all light, except that which comes through the pictures, should be minimised.

Much may be done to enhance the value of a good colour transparency if attention is paid to the mounting of the pictures, and the photographer should be careful to mount the picture so that its back is shielded from direct front light. For transparencies of half-plate size and upwards, it is a good plan to have each one in an open frame of fairly deep moulding to isolate the picture from its surroundings and cut off light not actually needed to penetrate it. This frame is supported upon struts at an angle of about 45 deg., and at the back of it is laid horizontally a white reflecting card or, better still, a mirror, to reflect the light up into the colour picture. A specimen of this may, I think, be seen holding a portrait Autochrome in the museum at the house of the Royal Photographic Society. If the front of the frame can be fitted with a simple form of hood, which need only be of stout card covered with American cloth, through which the transparency is examined, and the whole stood upon a table near a well-lighted window, no trouble will be experienced in getting a satisfactory view of the picture. This costs but little, and may be so made that the colour transparencies may be easily changed. If the transparencies are only of small size, such as 3½ × 2½ inches, the frame may be larger, and a number inserted between two pieces of glass. In this latter case care must be taken to stop all light coming between the transparencies. If they are carefully arranged in, say, sets of a dozen or eighteen a surprisingly attractive and brilliant effect will be produced, and, to my mind, there is no better way of displaying a collection of screen-plate colour-transparencies. If the photographer does not wish to go to the expense and trouble of fixing the two struts of a hood and reflecter, as above suggested, the frames may be simply examined against the light in the usual way.

Another way of dealing with small colour transparencies is to mount each one between two larger pieces of glass, the unoccupied spaces upon the glass being filled in with cardboard, the whole bound up with "passe-partout" binding, and a black paper mark fitted to the front of the transparency. This will serve in isolating the picture from its surroundings and assist in viewing.

Autochromes are often mounted in the folding mirror cases issued by Lumière for this purpose; the colour transparency is placed at the top, and its image reflected into a mirror on the inside of the case. This method is entirely satisfactory: the picture is viewed without difficulty, and all surplus light is cut off by the sides of the case.

In conclusion, it may be remarked that at photographic exhibitions the colour work has not been shown under fair conditions in the past years, even the R.P.S. itself not being above reproach in this direction. I for one am glad to read that the Council have given this matter their attention, and have devised a better method of showing the exhibits in this section, an announcement which should encourage a larger entry.

ROBERT M. FANSTONE.

THE LATE HENRY HESS.—We see the announcement in an American journal of the death of Henry Hess, a mechanical engineer in the United States, who for some time was associated with Mr. F. E. Ives, in the Hess-Ives Co., formed to place certain of Mr. Ives' inventions on a commercial basis.

THE PRINCE'S TOUR IN COLOUR CINEMATOGRAPHY.—Incidents of the Indian tour of the Prince of Wales are being recorded by the Cinechrome process of colour cinematography, an additive two-colour method which has not yet been publicly exhibited. Five Cinechrome operators have accompanied the Prince on his tour.

LONDON'S COLOURED BUILDINGS.—Colour photographers who complain about the drabness of London's streets and buildings, and the unsuitableness of the same for screen-plate pictures, will be interested to to learn that Mr. Thos. E. Collcutt, the veteran Past President of the Royal Institute of British Architects, has organised a competition for young architects and students, who are to prepare designs for a business building facing on an ordinary London street, in which "colour" of a permanent nature is to be the dominant feature. £200 has been given by an anonymous donor to provide prizes.

THE HAMBURGER PROCESS OF COLOUR CINEMATOGRAPHY.

INVENTION in colour-photography continues to find its chief activity in the field of colour cinematography, where, however, the problem is of infinitely greater difficulty; the rewards, on the other hand, correspondingly great. It is pretty evident from the accounts which are published of inventions for motion pictures in colour that the commercial demand is for a film in colours which can be shown in any cinema projector in exactly the same manner as an ordinary monochrome film. This requisition again makes the most severe demands upon the ingenuity of the inventor and the skill of the manufacturer. As a means towards reducing the complexity of the problem, two-colour processes of cinematography have been in the forefront of late years, and undoubtedly there is a good deal to be said commercially for the adoption of this simpler form of the process, since the audiences in cinema theatres are not of a highly critical kind, and undoubtedly will be quite satisfied with pictures in colour, even though the colour rendering is not a faithful reproduction of the colours of Nature or of the costumes and scenery in a studio-produced film. The great thing is that the animated colour pictures should be pleasing in character, should have a wider range of colours than has been obtainable hitherto in two-colour processes, and particularly, should be readily producible on the industrial scale.

These considerations having long been in our mind, we were greatly interested in having the opportunity a few days ago of witnessing a laboratory and screen demonstration of a new method of colour cinematography—of colour-photography also—which has at length been worked out by Mr. Aron Hamburger, who, as many people no doubt know, has assiduously devoted himself to this problem for some years past. The process which we witnessed is a two-colour method in the sense that two films are exposed in the taking camera, one representing the red and yellow colour sensations, and the other the green and blue-violet colour sensations. The particular novelty of the new process does not concern the taking of the negatives, although certain improvements have been made in this part of the process as the result of Mr. Hamburger's previous experience and research in making colour separation negatives at one exposure for composite three-colour printing. The new feature of the method lies in the production of the ready-to-show cinema colour film. A new form of simultaneous selective dyeing and mordanting of four colours on to the film at one operation has been designed and unquestionably appears to be of such simplicity in operation that the making of films on the industrial scale should be an easy matter.

One method of working the process is as follows:—Printing is done on a double-coated positive film, images from one colour-sensation negative being simultaneously printed on one side in register and corresponding with those of the series from the other negative on the other side of the film. This double monochrome film, having been developed, fixed and washed in the ordinary course, is then treated in a special machine by which the two sides are simultaneously coated, one with a mixture of red and yellow dyes, and the other with a mixture of blue-violet and green dyes.

The crux of the process lies in the discovery of a definite chemical reaction, which takes place between certain organic dyes and silver photographic images, in the presence of certain reagents. This reaction renders the silver image selective of the colours with which such images are created, in direct relation to their colour value. The dyes which have been found to respond to this reaction are extremely few in number, but practically the whole spectrum has been covered by the colours which have now been standardised for the process.

The film having received this duplex dyeing (or rather coating, since at this stage it is not chemically dyed), on each side, it is then treated as a whole in a bath which simultaneously converts the silver image into a dye-receptive compound, and mordants the dyes to form staple dye images. At this stage of the process the film scarcely shows the pictures of which it consists, since these are masked by the excess of dye which is used. It is in the next stage, that of washing, that the special feature of the process becomes evident. It is found that in the case of the series of pictures which have received the mixture of red and yellow dyes, the result of washing is to obtain a gradual gradation from red to yellow in the colour of the dye image in correspondence with the density of the original silver image; that is to say, the shadows in the pictures are dark red, due to fixation chiefly of the red dye, whilst the high-lights are yellow in consequence of a like fixation in these parts of the yellow dye, the dyes are completely discharged from the non-silver portion of each image leaving unstained whites. Similarly, on the other side of the film, the process results in emphasis of the blue in the shadows and the green in the high-lights. The remainder of the process consists in the use of a mordanting bath for fixation of the colours and of a clearing bath for removal of the silver compound, thus leaving ultimately a pure and exceedingly transparent duplex, or, perhaps, one should say quadruplex, dye image.

We were interested in hearing the expression by two eminent dye chemists, with whom we witnessed the demonstration, of their very great interest in this phenomenon of selective dyeing during the chemical treatment of the silver image. Mr. Hamburger has his theory that the phenomenon is due to graduated saturation of the silver image by one dye, so that the other is limited in the degree of its action. We heard also the suggestion that the effect may be due to the different rates of diffusion of dyes of different molecular weight. However that may be, it was evident that the process allows of a considerably greater variety of colours being produced in the finished film taken from two negatives than is the case in other processes likewise based on the making of two negatives. We saw on the screen a considerable number of short lengths of film in which there were well rendered not only the hues of complexions, but also yellows, greens and blues. So far as the production of colour film is concerned it is pretty clear that the dyeing and subsequent operations may be carried out as readily and quickly as the processes of development, fixing and tinting which are in regular employment in the making of monochrome films.

The process also is applicable to the making of colour photographs, either prints or transparencies, since two negatives may be exposed in almost any ordinary camera, film to film, prints made from each and dyed with a mixture of dyes, mordanted, washed, etc. For either a print or a transparency assemblage in registration is thus reduced to the single operation of putting two films together for mounting either on paper or on a transparent support. We understand that the process has been covered by patent, the specification of which should be published before very long by the Patent Office.

DESENSITISING IN THE DEVELOPMENT OF AUTOCHROME PLATES.

THE advantages of the desensitising process in the development of Autochrome plates are the subject of strong recommendation by M. J. Carteron in a recent issue of "La Photo-Pratique." M. Carteron confines himself to the use of phenosafranine as a preliminary bath, which, he finds, is the only way in which the desensitiser can be employed with Autochrome plates. A suitable strength of bath is 1 part phenosafranine in 2,000 parts of water.

For developing a quarter-plate Autochrome about 3 ozs. of this desensitising solution is placed in a quarter-plate dish, and the Autochrome plate immersed in it in the dark. After the expiration of 1 minute, development may be done by bright yellow light or by the light of a candle placed about 5 or 6 ft. from the development dish, with or without the interposition of a pale yellow screen in front of it. Developing under these conditions the appearance of the image may be readily followed either by reflected or transmitted light.

The developers usually employed for Autochrome plates serve equally well when a desensitiser is employed. The following metol-hydroquinone is a very good one:—

Metol	3 gms.	25 grs.
Soda sulphite, anhydrous ...	75 gms.	1½ ozs.
Hydroquinone	8 gms.	70 grs.
Soda carbonate, cryst	60 gms.	1¼ ozs.
Potass bromide 10 per cent. solution	5 c.c.s.	40 minims.
Water, hot	1,000 c.c.s.	20 ozs.

The water should be boiled before use, and employed after it has cooled a little.

A developer of hydroquinone alone may be used, since the preliminary bathing of the plate in the desensitiser greatly accelerates the developing power of the hydroquinone, particularly if the bath contains potass bromide. It then yields results which do not

suffer from excessive contrast; in fact, the results are closely similar to those obtained with metol-hydroquinone.

Fog is conspicuously absent, and development can be continued as long as required, working either on the factorial or time system, or, according to the method by which the progress of development is judged, by the change of the image from a negative to a positive.

As soon as development is finished it is seen that the Autochrome film retains a certain quantity of the phenosafranine, which gives it a yellowish tint. This colouration cannot, of course, be allowed to remain in an Autochrome transparency, but it disappears in the reversing bath of acid permanganate. The phenosafranine has no injurious action whatever on the rendering of the colours by an Autochrome plate.

After rinsing the plate for 30 seconds in clean water it is placed in the customary reversing bath made up of potass permanganate and sulphuric acid, the reversing action being followed in full light.

M. Carteron dwells particularly upon the advantage of the desensitising method in the treatment of Autochromes. Apart from the elimination of fog, there is, he finds, an advantage in the satisfactory use of plates which have exceeded the time limit allotted to them by the makers. Moreover, he is inclined to think that stronger results are obtained when the plate is desensitised, and that thus better results are obtained when exposure has been somewhat cut down.

MAKING PAGET COLOUR NEGATIVES IN A SMALL ROLL-FILM CAMERA.

THERE must be many amateur photographers who possess only a small folding pocket camera of the roll-film pattern who would like to make an essay with the Paget colour process, but who do not wish to go to the expense of a plate camera for this purpose. The following notes and illustrations will show how very simply a watch pocket camera of the 2¼ square pattern was adapted for the Paget process with success. The plan, with necessary variations, may be employed with any roll-film camera fitted with a detachable back, and of a size for which the taking screens and panchromatic negative plates may be obtained.

As will be seen from fig. 1, which shows the camera with the back removed and the plates and springs in position, the spool chambers are filled temporarily with pieces of wood, cut as shown in the sectional sketch fig. 2. The projection A comes upwards

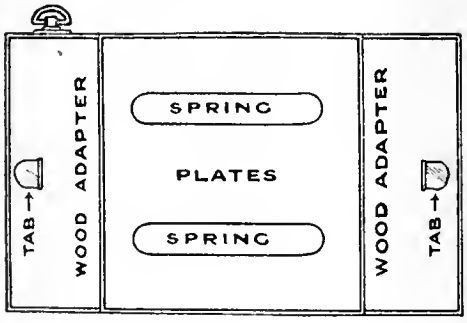


Fig. 1.

Fig. 2.

and extends *inwards* to form a rebate, into which the taking screen and panchromatic negative plate may be inserted without the latter slipping. Two of these adapters are needed; they should be tightly fitted, and a couple of tabs of thin leather tacked to the outer edges in order to allow ease of removal. One of the adapters may have to be slotted, in order to allow the admission of the winding key of the camera.

The only other necessities are two springs to press the plates close together, with a view to ensuring perfect contact between the two. For this purpose an old clock spring of about three-quarters of an inch in width, and not too strong, which can be bought for a few pence from any jobbing clock repairer, serves well. For the 2½-square plates, two pieces, each about two inches long, are bent into a half-moon shape, with the edges just turned upwards in order to avoid scratching the plates. For larger sizes, longer springs must be used. A piece of thin black card is also needed, slightly larger than the plates and screens.

To load the camera, the yellow film filter should be inserted between the components of the lens, and the two wooden adapters inserted in the empty spool chambers. The camera is then taken into the dark room, the taking screen placed in position *film up*, the panchromatic negative plate laid upon this, *film down*, and then on the glass side of the plate is laid the piece of black card. This protects the plate from any chance of fog from the ruby window at the back of the camera. Upon this card the two springs are laid, and the back of the camera put on and clamped in the usual way. Care should be taken that, while the springs are strong enough to ensure contact between the two plates, they do not force the back of the camera open. Though the average film user might expect difficulty in loading the camera as suggested, this is not the case if the green safe light issued by the Paget Company is carefully employed, but at a safe distance.

Though simple, this method of making Paget colour negatives will be found satisfactory in use; in fact, better results may be obtained than is often possible with the single metal slides so popular to-day. The only disadvantage lies in the fact that only one negative can be made at a time, but, at any rate, the device allows colour photography to be practised in or near the home.—R. M. F.

A COMING COLOUR PROCESS.—At the Royal Photographic Society recently the president, Mr. W. L. F. Wastell, in the course of some remarks on a triple assemblage method of making colour prints, expressed the opinion that the process which would render colour photography generally popular would be on entirely different lines from those in which three colour components were superimposed. He added that he had good reason for saying (although he was debarred from making a more definite statement) that such a process would make its appearance before very long.

SCREEN-PLATE RENDERING OF THE SEA.—At a recent meeting of the South Suburban Photographic Society the questions of the precise colour of sea-water and the more or less satisfactory screen-plate renderings of scenes at or by the sea were discussed, a much-travelled member making some remarks of particular interest to colour workers. The intense blueness of the sea, depicted in Autochrome pictures made on the Riviera, was commented upon, no English-made picture of the sea showing such rich blueness. The sea is usually described by descriptive writers, and pictured by artists, as being blue, but as everybody who has seen the sea knows this is not always the case. The natural colour of water in bulk, it was stated, may be said to be blue, but the blueness is always modified by particles of matter held in solution and by the colour of the ocean bed. A good blue sea, it was pointed out, was impossible on the muddy bed at Southend, one was far more likely to find blueness on shores washed by the Atlantic, or at Bournemouth, where the water was deep. The open and deep sea is usually blue enough for Autochrome workers, but shallow seas are of a greenish tinge, with a tendency to muddiness. The sky and atmosphere also play their part in making the water appear of varying colours. On a summer's day, for example, the sea may have the appearance of molten silver, while on a dull, cloudy day the water will appear to be lead-coloured, because of the reflections from the sky. It was, one speaker said, the intense blueness of the sky above the Mediterranean that gave blueness to the water, and it was useless to expect such blueness on our own coasts. Screen-plate pictures taken looking seaward from Monte Carlo had been taken to the shore a short time after taking and finishing, and the blueness of the Autochrome had been compared with the blueness of the water; the colour was found to be faithfully rendered, but on bringing the pictures to England the blueness was questioned and hand-colouring suspected. The blueness appeared to be more intense, or "Recketty," when viewed in England than when viewed at Monte Carlo. Authorities (non-photographic) appear not to be in agreement concerning the real cause of the ocean's blueness, some maintaining that the blueness depends upon the amount of salt contained in the water, it being pointed out that the Mediterranean and the Gulf Stream are both very salt, and that the former is a deep azure, while the latter a decided indigo blue. Another speaker said that this condition could not relied upon, for the bluest sea he had ever seen was the Sea of Galilee, the water of which is fresh and drinkable and not salt, while the Dead Sea—the saltest sea on earth—was of a very disappointing blueness, much below the Mediterranean in richness of colour and very much behind the blueness of Galilee.

No. 188 VOL. XVI. JULY 7, 1922.

THE BRITISH JOURNAL OF PHOTOGRAPHY

MONTHLY SUPPLEMENT

ON

Colour Photography.

CONTENTS.

EXTRA-SENSITISING OF AUTOCHROME PLATES.

[Considerable interest has been aroused in France by the publication in the "Bulletin" of the French Photographic Society of a note by M. F. Monpillard, deposited with the Society in a sealed packet in January, 1913, describing a method of obtaining greatly increased sensitiveness, up to thirty times, of Autochrome plates. M. Monpillard's communication has been followed by a paper on the practical employment of the method by M. L. Gimpel, who was a collaborator, in the use of the extra-sensitised plates. The following is a translation of the two communications.]

M. MONPILLARD'S NOTE OF 1913.

The first experiments relating to the method described in the present note, which has been written for purposes of claiming priority, date from November, 1911. In view of the fact that most of the formulæ for solutions used in orthochromatising or panchromatising plates contain ammonia, I formed a theory that the effect of this ammonia was to dissolve a minute proportion of the silver haloid in an emulsion, and thus to facilitate the combination of the silver haloid with the colour sensitiser so as to give sensitiveness to certain rays of the spectrum.

This hypothesis of a combination between the silver and the dye is quite in accordance with observed facts. An aqueous solution of eosine can be precipitated by a soluble silver salt, the resulting coloured precipitate being soluble in ammonia.

Starting from this hypothesis it occurred to me that the general and colour sensitiveness of a photographic preparation could be augmented by means of an orthochromatising bath containing sensitising dyes combined with a suitable silver salt. In the first instance I turned to combinations of silver with chlorine, bromine and iodine, and my first experiments were made with silver chloride, chosen on account of its special solubility in ammonia.

The first experiment on these lines showed me that a very considerable increase in the general sensitiveness is produced by the presence of a very minute quantity of silver chloride in the colour-sensitising bath. At this time (November, 1912) M. Simmen confirmed this result experimentally.

By a series of systematic experiments I then determined, for the special case of the extra-sensitising of Autochrome plates, the best proportion of silver chloride for addition to the colour-sensitising dyes in order to obtain the maximum effect without risk of fog. Under these conditions it was found that the sensitiveness attained by an Autochrome plate is thirty times that which it possessed before treatment. On the other hand, experiments showed that this sensitiveness is preserved for at least thirty-two hours, and that no fog is produced even when this period elapses between the treatment of the plate and its development after exposure. At the same time absence of fog is conditional upon the quickness with which the plate is freed from the sensitising solution and is subsequently dried.

Experiments were successfully made with citrate and with acetate of soda, also with silver potassium cyanide, in all cases in ammonia solution. The last-named double salt does not permit of the sensitiveness being increased so greatly as with silver chloride. Silver citrate possesses little advantage, and silver acetate gives fog. In an experiment made on January 12, 1913, the use of colloidal silver solution instead of silver chloride appeared to give interesting results.

On the whole, while silver bromide and silver iodide in the presence of certain colour sensitisers conferred greater sensitiveness to certain rays than does silver chloride, the insolubility of silver bromide in ammonia and the very slight solubility of silver iodide in the same solution showed me that it is not practicable to employ these compounds in place of silver chloride or to use them in conjunction with silver chloride in colour-sensitising baths. It occurred to me, however, to add a soluble bromide or iodide to the ammonia solution of silver chloride in the hope that a reaction would be produced in the sensitive film and that bromide and iodide of silver would thus be combined with the colour-sensitising dyes. Nevertheless, experiments showed that the addition of any soluble bromide, producing a precipitate in presence of silver chloride, was useless. On the other hand, addition of solutions of ammonium iodide, zinc iodide, or cadmium iodide, is possible within limits. The first experiments showed that a considerable increase of sensitiveness can be produced in the gelatino-bromide emulsion by this means.

In concluding this note I will add that my laboratory tests having interested our member, M. L. Gimpel, the latter has rendered me the help of his wide experience in the practical use of the results which have been obtained, and I have to thank him for the very valuable assistance which he has given, and continues to give.

F. Monpillard.

P.S. Applying this method to the treatment of plates for ordinary monochrome photography M. Gimpel has been able to make night photographs with relatively very short exposures under the ordinary lighting used in Paris.

INSTANTANEOUS EXPOSURES ON AUTOCHROME PLATES.

[The following is the paper by M. L. Gimpel to which reference has already been made. We are indebted to the French Photographic Society for permission to make the translation from the Society's "Bulletin."]

I must first express my deep regret that M. Monpillard, owing to his distance from Paris, is not able himself to make this communication with the clearness and ability which the Society has so frequently had the opportunity to appreciate.

As is well known, the Autochrome plate has a sensitiveness which is from 1-50th to 1-60th that of an ordinary rapid plate, such as the Lumière "Blue Label," employed in monochrome photography. This low degree of sensitiveness arises largely from the absorption of light by the coloured starch grain and by the compensating light-filter, and renders it impracticable to give instantaneous exposures except under the two following exceptional conditions:—

(1) Marine subjects, which, owing to the great actinic strength of the light, can be taken at speeds ranging from 1-5th to 1-10th of a second with a lens working at about *f*/4.

(2) Exposures from a balloon. These may be taken at about the same speed, provided that the angular movement of the balloon is very small. I made the first of such exposures in the year 1898 at an elevation of several hundred metres above St. Leu-Taverny and Falmondois.

It was natural that the idea should occur to certain workers of increasing the sensitiveness of Autochrome plates sufficiently to permit of instantaneous exposures. One of our members, M. Simmen, showed for the first time at a meeting of the Scientific section on June 14, 1910, and afterwards at the general meeting on July 8 of the same year the result of his work in this direction. By combining the colour-sensitising dyes, pinachrome, pinaverdol and pinacyanol in weak alcoholic solution without addition of ammonia, M. Simmen devised a hyper-sensitising bath in which, by immersion for a few minutes, followed by rapid drying, the plate was rendered four or five times as sensitive.

This increase of sensitiveness, specially for the less refrangible rays of the spectrum required the modification of the light-filter which M. Simmen prepared at first solely with æsculine; that is to say, a colourless filter absorbing only the ultra-violet rays. The plates could be kept before development for about three weeks.

M. Simmen's communication was accompanied by the projection of a number of transparencies which created much interest, although the colours of some scenes were not rendered quite satisfactorily. Afterwards, when the process had been worked out, M. Monpillard showed us that hyper-sensitising favours the reproduction of some colours; violets and purples, which the Autochrome plate in the ordinary way does not always reproduce correctly, are rendered with great fidelity on the hyper-sensitised plates.

At a meeting of the Society on November 18, 1910, M. Emile Vallot, well known for his work in three-colour photography, presented a hyper-sensitised Autochrome taken at Luna Park, Neuilly, showing perfectly the life and colour of this thoroughfare. M. Vallot explained that he had simply used the Simmen process, with very slight modification of the proportion of the dyes and with introduction of a little yellow into the light-filter.

The results obtained by M. Vallot prompted me to make some experiments, and my first hyper-sensitised Autochromes were made on December 28, 1910, with plates which M. Simmen had kindly sensitised for me. M. Vallot also very kindly gave me all the details of his method of working, and laid particular stress on the use of a whirler for removing surplus sensitising solution from the plates in order to dry them as rapidly as possible. M. Vallot stated that his sensitising formula was somewhat inferior to that of M. Simmen, inasmuch as the plates did not keep quite so long, but experience showed me that by taking suitable means for rapid drying they could be kept for more than a month.

Another experimenter, M. Thovert, used a single sensitising dye, namely, pinachrome, the employment of which allowed of the use of a light-filter which could be purchased in the ordinary way, namely, that made by MM. Lumière for the reproduction of Autochromes by magnesium light. Other contributions to the practice of hyper-sensitising were also made by M. Palocsay and M. Jové; and on March 15, 1912, M. Adrien showed a very simple apparatus by which any amateur could easily hyper-sensitise his plates. This device, coupled with the sale of the sensitising solution by MM. Poulenc, ready for use and standardised by M. Monpillard, should have extended the use of this method among Autochrome workers, but, unfortunately, little interest is taken in it.

Towards the end of 1911, or beginning of 1912, M. Monpillard, knowing that I was interested in instantaneous colour-photography, particularly in my work for "L'Illustration," told me that he was experimenting with a new process of hyper-sensitising, and that the first laboratory tests had given results, as regards increased sensitiveness, which he had never hoped for; further measurements showed that the sensitiveness was increased thirty times. I anxiously awaited information concerning the method, but my first subsequent meeting with M. Monpillard was a great disappointment. M. Monpillard told me that his idea had no practical interest, since the plates had to be used at once, their preservation in working condition being a matter of hours. While admitting this drawback, I pointed out to M. Monpillard that there were many occasions on which the process could be used. However, M. Monpillard held to his view, and we did not discuss the process until November, 1912. M. Monpillard then said that he wished me to study the practical use of his process, which latter he had described in a memorandum deposited as a sealed packet at the French Photographic Society on January 17, 1913.

In the course of my experiments, ranging from November, 1912, to July, 1919, we tried the compensating light-filters most suitable for correct rendering of colours in daylight and by incandescent and arc electric lamps, since these latter were used in the theatres. M. Monpillard worked out twenty-six different light-filters which I tried in the workroom, out of doors, and at the theatres. We used 320 plates in these tests and in our experiments, made for the purpose of improving the keeping properties of these ultra-sensitised plates. I use the word "ultra-sensitised" to distinguish the process from that (hyper-sensitising) in which a lesser increase in sensitiveness was produced. M. Monpillard, being unable to continue the work which we had undertaken for the purpose of perfecting the process, decided at length to publish the contents of his sealed memorandum, as was done at the meeting of the Society on March 24 last. He did so with the hope that other experimenters would succeed where we had failed. When the note was read some dissatisfaction was expressed that it did not contain the sensitising formula which was used. I can now remedy that deficiency. The difference between ultra-sensitising and hyper-sensitising consists simply in the addition, at the time of use, of a small quantity of silver chloride dissolved in ammonia to the mixture of the sensitising dyes. The following are the stock solutions of the dyes:—

A.	Pinaverdol	1 gm.
	Alcohol, 90 deg.	1,000 c.c.s
B.	Pinachrome	0.05 gm.
	Alcohol, 90 deg.	1,000 c.c.s.
C.	Pinacyanol	0.05 gm.
	Alcohol, 90 deg.	1,000 c.c.s.

Solution D.

Stock solution A	100 c.c.s.
Stock solution B	100 c.c.s.
Stock solution C	47 c.c.s.

According to theory, 56.4 c.c.s. of the C solution should be required.

It must be understood that the latter figures are approximate. Before the war two different makes of sensitising dyes showed variations which required the composition of the mixed sensitising solution to be adjusted. Since the war the variations are greater, since dyes are not manufactured with such care and also because there are differences between those sold in Germany and those which are exported.

E. Concentrated Sensitising Solution.

Solution D	400 c.c.s.
Alcohol, 90 deg.	600 c.c.s

F.—Silver Chloride Solution.

Water, distilled	92 c.c.s
Ammonia, 22 deg.	8 c.c.s.
Silver chloride	0.2 gm.

G. Working Sensitising Solution.

Solution E	10 c.c.s
Solution F	10 c.c.s.
Alcohol, 22.5 deg.	80 c.c.s

As regards working methods, it is most essential to provide the means for drying the plate with the greatest possible speed. I think M. Vallot was the first to recommend a whirler for drying. There are, as you know, several patterns. I do not recommend the ordinary dark-room whirler, actuated by an endless screw, since the wear on the teeth is very rapid. The band type is certainly better, but on the whole my preference is for the water-motor pattern, which is rotated at the rate of 1,500 revolutions per minute with small consumption of water.

M. Vallot uses a grooved tank for the sensitising bath, and provides it with a capillary outlet, so that the solution drains away very slowly and completely, the plates being perfectly free from adhering liquid when they are removed. On no account must a metal dish or tank of any description be used for a sensitising solution containing the silver chloride. Glass or glazed earthenware must be employed.

For drying, an electric fan, delivering ample quantities of air into the grooved box in which the plates are arranged, is a necessity. M. Monpillard has described a fan suitable for this purpose ("Bull. Soc. Fr. Phot.," June, 1914, p. 184).

As regards dark-room illumination, in ordinary Autochrome work I use a lamp containing a carbon filament bulb of 5 c.p., provided with one yellow and two green Virida papers. For ultra-sensitising, I fold my Virida papers round a sheet of cathedral green glass and arrange the lamp so as to carry on the operations in shadow.

Sensitising should be done at a low temperature. In summer I make up a cooling mixture of ammonium nitrate and water, standing the glass dish containing the sensitising solution in this mixture. Having carefully dusted the first Autochrome plate, it is immersed in the sensitising bath and the stop watch started. At the end of three minutes the plate is quickly replaced by a second, and the first plate deftly placed upon the platform of the water whirler. After about a minute the water is stopped, and the surface-dried plate placed in the electric drying box. By working in this way no time is lost. If a box of four plates is being sensitised, by the time the fourth is being put into the drying cupboard the first will be ready for insertion in the plate-holder. This means that the first will have occupied about ten minutes in preparation, but it is practically certain that it will have been dry at the end of three or four minutes.

I do not recommend strengthening of the sensitising bath, as some workers have suggested. I prefer to use 100 c.c.s. for sensitising six 9 by 12 cm. plates and then to throw it away.

Exposures have been made with the *f*/4 Lœwe-Berthiot anastigmat fitted with the J. H. light-filter prepared by M. Monpillard for plates either hyper- or ultra-sensitised. While I am not particularly fond of the focal-plane shutter, I admit that for our special purpose of obtaining the greatest action of light its high efficiency is an advantage.

Development is important. M. Adrien has shown us some remarkable Autochromes made on hyper-sensitised plates and developed with pyro. But they were not instantaneous exposures, and pyro is the most unsuitable developer for Autochrome plates which have not been fully exposed. Some recent experiments made by Le Comte de Dalmas have shown that, as compared with pyro, one-third the exposure may be given if the plates are developed with metoquinone. I, therefore, use this developer in double strength, *i.e.*, 40 parts per 100, instead of 20 parts per 100, as recommended by M. Vallot.

Development should be done with as little delay as possible, since the ultra-sensitised plates keep for a very short time, and, moreover, this time varies considerably. The longest period which I have allowed to elapse, whilst still obtaining a satisfactory result, was 13½ hours, but it is well to develop, at any rate, within twelve to twenty-four hours of the plates being sensitised. I have tried many means for prolonging the preservation of the ultra-sensitised plates, such as keeping them under mercury, varnishing the film, immersion in carbonic acid or nitrogen, but all without result.

M. Monpillard and I made some experiments on the advantage of backing the ultra-sensitised plate with a white instead of a black card, as recommended by M. L. Lumière in 1910. Workroom tests on ordinary Autochromes showed that exposure could be reduced to about two-thirds by this means, but when we tried this method on the ultra-sensitised plates it failed completely. By courtesy of M. Lucien Guitry we made a series of exposures from a good place in the theatre on scenes in the play "Kismet," the ultra-sensitised plates being backed with white cards which had been kept in the dark for several days previously. On development not a trace of image was obtained on any of the plates. On the next day a new series of exposures were made on plates backed with black cards, with complete success. Shortly afterwards some tests were made by backing the plates with silvered copper plates, as used in the Daguerreotype process, but no difference could be found between these results and those made under the same conditions, except that the plates were backed with black cards. I mention these contradictory experiences without being able to explain them. Possibly the effect of the white card is simply to produce an initial change in the sensitive film, in the case of the ultra-sensitised plate this change perhaps proceeds altogether too far.

Here I should mention also a phenomenon, the cause of which we have been unable to ascertain. Some of our Autochromes have shown pinkish mottling of greater or less depth. In some cases this defect, which is encountered also with hyper-sensitised plates, shows over areas which have soft segmented edges, whilst in others the markings are well defined and resemble the patches produced by the use of developer in quantity insufficient to cover the plate.

Some of our results have been obtained from aeroplanes. By permission of M. Maurice Farman I made twenty-two flights, but from causes which I could never discover failed to obtain a single good Autochrome on the ultra-sensitised plates. I have one passable result to show you, made at about 200 metres in November, 1916, with an exposure of 1/50th of a second. The only satisfactory results were obtained by the hyper-sensitising process. With the help of the skill of the airman, who drove his machine against the wind at reduced engine speed, and with luck in dodging the roll of the machine at the moment of exposure, I made the first two Autochromes obtained from aeroplanes in May, 1917, with an exposure of 1/15th of a second at *f*/4.

L. Gimpel.

GARDEN PHOTOGRAPHY BY THE SCREEN-PLATE PROCESS.

If there is one branch of photography more than another in which the screen plate colour processes may be employed with advantage it is in the portrayal of garden scenes. This is a possibly remunerative field for the progressive professional photographer. Colour is the very essence of the delight of the garden, and without it, no matter how highly technical the skill of the photographer, even the best that a monochrome photograph can attain to will fail to satisfy the ideals of the owner or designer of a beautiful flower garden. This is the crux of the whole matter. The garden lover wants photographs as records of what he has accomplished, and which will last long after the glory of the original has departed. The field is a wide one for professional work. Certain seedsmen have adopted the idea, presumably using the three-colour process, though so far the results, from the point of view of truth and general photographic quality, leave much to be desired, particularly in the case of garden scenes, which are to a marked degree inferior to studies of individual flowers, though, of course, something may have been lost of the beauties of the original picture in the reproduction.

In order to be successful, the photographer must keep in mind the requirements of the owner of the garden, even if this entails the sacrifice of his own pictorial ideals to some degree. The forms and characteristics of the occupants of the herbaceous border correctly rendered will certainly be far more pleasing to the customer than a more artistic rendering of masses of colour. The foundation of success in faithful colour rendering lies in the greatest exactitude in exposure. If the subject is an important one, and the owner of the garden is prepared to go to the extra expense, it is a good plan to make a test exposure, as follows:—The meter test of the light is carefully taken, and the exposure worked out, we will assume, at 1 second. A colour plate is exposed in steps of, say, ½, ¾, 1, 1½ seconds respectively, pushing the shutter of the slide in after each one, in the same way that an exposure test is made when enlarging upon bromide paper. The plate is developed and quickly finished. Upon examination, the worker will be able to judge of the length of exposure to give to ensure the most satisfactory result. This is an essential experiment for any colour photographer who is wishing to get the finest possible results. The experiment suggested above will ensure much more faithful colour translations.

In regard to the choice of subject, the photographer is, as a general rule, in the hands of others, although he can do a good deal as regards choice of view point and lighting to bring about the most satisfactory results. He will do well to avoid, as far as possible, stunt lightings and freak effects. Figures may often be employed in assisting the composition of garden pictures in colours, especially feminine ones wearing bright or distinctive clothing. They may be suitably posed, strolling along walks or in the rose garden, and, if kept properly subordinate to the rest of the composition, have a decidedly helpful effect.

The choice of lighting should also receive careful consideration. Bright sunshine is almost essential in order to ensure that the colours are fully emphasised on the plate. The sun should not be directly overhead, the best results being generally obtained when the sun is low, early morning or late evening, in my experience, being productive of the best results. I need hardly say that there should be no wind, for nothing detracts so much from the beauty of an otherwise good colour transparency than blurred images, due to movement. If the work must be done during windy weather—and the fleeting nature of some of the subjects often demands that it is a case of "now or never"—still moments should be carefully watched for and the shutter closed directly movement begins.

In regard to equipment, little need be said. One point, however, may be mentioned. It is customary in this class of work to recommend a lens of fairly long focus. Whatever may be the advantages in this connection, there are certain disadvantages, and my own preference is for an instrument of fairly short focus, for the simple reason that depth of field may be obtained without too much stopping down. Even under the most favourable conditions the exposures are long enough, and a lens that will give a sharp image over many planes at an aperture of not less than $f/6.8$ is a decided advantage. ROBERT M. FANSTONE.

THE UVACHROME PROCESS.

SOME particulars of the process which has attracted a certain amount of curiosity on the Continent are given in the Festnummer of "Photographische Korrespondenz" by its inventor, Dr. A. Traube, of Munich. The process is one of dye-toning, in regard to which Dr. Traube refers to his patent of 1907, in which silver iodide, obtained by bleaching the silver image with iodine, was the mordanting substance. Apparently he claims to have been the first to have employed copper ferrocyanide in place of silver iodide as a dye mordant. He dwells upon the variations in the composition of the bleach of copper sulphate and potass. ferrocyanide, which may be made for the purpose of securing any degree of transparency or opacity in the dye-toned images. Moreover, the dyed copper ferrocyanide image is susceptible of being intensified or reduced within considerable limits. These properties of copper ferrocyanide are the base of the process.

In practice, a set of three negatives is made on Uvachrome film, viz., cinematograph film coated with a special emulsion. Soft transparencies are printed by contact, and treated in the copper bleaching solution. After washing for 5 or 10 minutes, they are dyed in colours complementary to those of the respective taking filters by means of special Uvachrome yellow, red and blue dyes, this operation requiring about 10 minutes. They are then treated for about half a minute in a clearing bath and washed. The clearing bath is chiefly of hypo, by which both the copper and silver ferrocyanides are dissolved out. After a further wash of 10 to 15 minutes the separate component images are dried, and are ready for assemblage.

Before mounting, however, the three films are brought one on another on a glass plate, and temporarily fastened together in register with clips. By this means the effect of the final result may be judged. If the negatives have been correctly exposed and printed, the colour rendering will be correct, but, as required, modifications can be made in the component dye images, any one of which may be reduced in depth by a bath of weak acetic acid or strengthened by a dip in the original dye solution. Dr. Traube does not say how the three transparencies of practically postage-stamp size are permanently superimposed in accurate register.

At present the process is adapted only for the making of three-colour transparencies, but it is hoped to apply it also to the making of paper prints. It is stated that thousands of the transparencies have been made, and that the percentage of throw-outs does not exceed 1 per cent. to 2 per cent.

DEVELOPER FOR AUTOCHROMES.—In "Photo-Era," E. K. Elmslie recommends the following developer:—Water, 5 ozs.; metol, 26½ grs.; hydroquinone, 3½ grs.; sodium sulphite (dry), ½ oz.; stronger ammonia, 1½ drs; potassium bromide, 15 grs. Use 2 drams of above plus 1 oz. of water. Develop 2½ minutes at 65 deg. F. Metoquinone can be made by mixing saturated solution of metol and hydroquinone in the ratio of their molecular weights, dissolving and precipitating with sodium sulphite. Consequently this ratio was used but precipitation was dispensed with altogether.

THE BLEACH-OUT PROCESS.—In a recent issue of "Photographische Korrespondenz" Professor R. Kögel has a short note on tests of a dye of the new phenanthrazoxonium group prepared by A. Kehrmann. He is inclined to think that these dyes will lead to a successful development of the bleach-out process, rather an optimistic view, considering the great labour which has been spent upon the process in the past without result. The particular dye was dissolved in alcohol and "sensilised" with thiosinamine. It was thereby rendered so sensitive that it bleached out in the dark. Anethol sensitising gave a mixture which was quickly bleached in diffused daylight, but remained unaltered in the dark.

No. 189. VOL. XVI. AUGUST 4, 1922.

THE BRITISH JOURNAL OF PHOTOGRAPHY

MONTHLY SUPPLEMENT

ON

Colour Photography.

CONTENTS.

COLOUR PRINTS BY DYE CONVERSION OF SCREEN-PLATE NEGATIVES.

[An ingenious process is described in a recent patent specification, No. 182,167, granted to M. Obergassner, for the conversion of a colour screen-plate transparency into a three-colour print. Mixtures of dyes are used for preparing each of the three series of colour elements in the three-colour mosaic filter screen. Exposure is made through this screen in the usual way and the emulsion developed (without reversal) and without allowing the developer to come in contact with the dye-coating of the screen. The latter is then sensitised with bichromate and printed through the negative image. It is then developed in warm water and the colours finally "rectified" by treatment in a bath of weak hydrochloric acid which acts upon the dye mixtures used for each colour element in the mosaic filter. The resulting film is then mounted upon an opaque white support.]

The invention consists in the employment of a colloidal three-colour screen containing partly dyes which, by treatment with acids or alkalies, or by neutralising, oxidising or reduction, are rendered colourless and partly substances which are originally colourless and become coloured by the same treatment, the effect being to convert the screen colours into the respective complementary colours. For instance, an alkaline mixture of erioglaucine and acid fuchsine is blue. By treatment with acid it turns red. Erioglaucine is bleached by acids, and acid fuchsine, which is rendered colourless by alkalies, turns red again by treatment with acids. The other colours can be formed and neutralised in a similar manner.

The following example will illustrate the process:—

A three-colour screen is made up by a mixture of about equal proportions of red, green and violet gelatine grains obtained by spraying warm coloured gelatine solutions. The solutions are prepared from an alkaline gelatine solution (about 1 part gelatine to 3 parts water).

For the red grains about 400 gms. of the alkaline solution are mixed with 2 gms. water-blue, 2 gms. fuchsine and 2 gms. naphthalene-yellow, each quantity dissolved in about 50 ccs. of water. The water-blue loses its colour in the alkaline gelatine, and the other ingredients produce a spectral red.

For the green grains similar quantities of gelatine solution, naphtha-flouranthene, spirit-green and naphthalene-yellow are mixed. The naphtha-fluoranthene turns bluish in the alkaline solution and produces with the other ingredients a spectral green.

The violet grains are obtained from 400 gms. gelatine solution mixed with about 40 gms. cold concentrated flavaniline-S solution which is rendered colourless in the alkaline gelatine and about 50 gms. methyl-violet. This mixture will produce grains of a spectral violet colour.

For the preparation of the screen a glass plate may be used to which in the first place a thin, waterproof collodion film is applied. This film is brushed over with a thin gelatine solution which is first allowed to dry and then moistened for adherence to the gelatine grains which are strewn over it. Non-adhering grains are shaken off, and the adhering ones are flattened out by pressure so as to fill up the entire collodion surface. Thereupon the two films are trimmed, and the colour screen thus obtained is removed from the plate. A panchromatic emulsion is applied to the back of the collodion film. The combined photographic film and screen thus obtained is placed between thin glass plates in a dark-slide and exposed in a camera through the screen in the usual manner. The negative is developed and fixed in a dish having in its bottom an aperture to the edges of which the films can be clamped so that no liquid is allowed to penetrate to the colour screen. After fixing, the colour screen is sensitised, *e.g.*, by means of potassium bichromate, which is effected in a similar dish and with the colour screen upwards, the screen being allowed to dry in the dark. When the screen is dry it is placed in a printing frame and printed through the negative, whereby those parts of the screen which are exposed to the light become insoluble. The soluble portion of the colour screen and also the photographic film are then dissolved in warm water and removed, whereupon the screen elements still remaining on the collodion film will form a transparent but wrongly coloured positive. The colours are rectified by immersion in dilute hydrochloric acid which turns the red into blue, the green into red, and the violet into yellow. Applied to a white background, the film will thereupon present a clear picture in natural colours, the darker patches being produced by the presence, at these places, of all the different colours in close combination.

In the rectification of the colours the fuchsine and the naphthalene-yellow of the red grains are rendered colourless, and the water-blue is restored to the original colour. In the green grains the spirit green and the naphthalene-yellow are rendered colourless and the naphtha-fluoranthene is turned red. In the violet grains the methyl-violet is rendered colourless and the flavaniline turned yellow.

A screen may be made up the colours in which can be rectified in a similar manner by immersion in an alkali.

If any of the resulting colours should not possess the required vigour, owing to a tendency of the dye substance to wash away in the water bath, the colloid used for producing the respective filter colour of subsequent screens can be mixed with a substance which in the further treatment of the screen image becomes insoluble and which either renders the existing final colour more vivid or serves as a foundation by which to bind the dye. For instance, the colloid may be mixed with dissolved chloride of barium. In the further treatment, dilute sulphuric acid can be used for precipitating therefrom barium sulphate which is able to bind the colour substance with sufficient tenacity.

In the process, however, it is not necessary to mix the primary dyes with other prepared but colourless dye compounds, as one or more dyes may be produced synthetically in the colloidal medium on the photographic plate or film from the components of the dyes or from the by-products of the coal tar industry, such components being added instead of the prepared dyes. In this manner the scope of the process is considerably widened. For instance, the primary dyes can be mixed with colourless salts of diazo and nitroso compounds, capable of being converted into the respective dyes by suitable treatment. Thus the final colour is produced by colourless components which are subsequently converted in the colour-rectifying bath into coloured dyes.

In the above example, for instance, the final yellow may be produced by means of two components, of which one may consist of a mono-sodium salt of dioxyquinoline and the other of a solution of para-toluidine-hydrochloride and sodium nitrite. These components are substituted for the flavaniline and will turn yellow after the treatment with dilute hydrochloric acid.

REMINISCENCES OF COMMERCIAL COLOUR CINEMATOGRAPHY—ITS POSSIBILITIES.

The appearance of the Prizma colour cinematography, and the comments by the "British Journal of Photography" on this process, has again brought before colour workers, as also the general public, the query as to the probability of commercial colour cinematography.

After ten years' research and practical personal working of processes that have given promise of such realisation; after seeing over a million dollars in hard cash melt away in the attempt to capture this elusive illusion, I feel that my years of unique experience should be at the service of the many searchers and students who have not had similar opportunities to investigate and analyse the possibilities and probabilities of commercial colour films.

Many processes have been tried by numerous workers, differing entirely from those on which I propose to treat, but as they never reached the public in even an approximately practical form, we can assume they suffered from some incurable disease, so I confine my dissection principally to the two apparently healthy specimens that have been offered as the real and only.

Before entering into the whys and wherefores of success and failure, we must decide exactly, but very reasonably, what the expression "commercial" applied to colour moving pictures must cover.

Leaving aside such delightful ideas as "absolute colour rendering," "true to Nature," and confining ourselves to the limitations of panchromatic films, photographic processes, and chemical dyes, let us accept as a definition "a process of animated photography in colour (the colours approximating to those of the best known examples of modern *still* colour work), workable under practically black and white conditions."

The two processes placed before the public on a large scale for commercial exploitation, are those of the late Kinemacolor and the early Prizma. I say "late" Kinemacolor with regret, for that process was the forerunner of what so many of us have been striving for, and I take my hat off to that energetic and always smiling personage, who through thick and thin nursed and cajoled that scientific baby of premature birth.

As most of those interested are aware, Kinemacolor was a two-colour process, employing panchromatic film, one lens, and recording a series of alternating "red and green" negative pictures.

The camera, of the ordinary type but more strongly built, mounted with a rotary two-colour screen of complementary colours, was supposed to run at 32 per second—but the seconds were short ones.

After development with panchromatic precautions, the negative, which consisted of a series of black and white colour value records, was placed in a printer, and a black and white positive printed therefrom. This was twice the length of the normal black and white, as two pictures were required to record one complete image.

The projector, of the common "beater" type, but of athletic build, provided with a synchronising colour shutter, was also supposed to run at 32 per second, but it was really driven at a dizzy rate, and it says much for its constitution that it survived as long as it did.

In spite of born showmanship that directed the destinies of Kinemacolor, and the sensational Durbar pictures that interested even Royalty, the process flickered out.

The chief reasons were: In recording negative:—

(a) The lack of exposure, except under unusual conditions.

(b) The irregularity of the panchromatic stock.

(c) The alternate exposure of the red and green images instead of simultaneous.

In printing positives:—

(d) The necessity of a "perfect" print to give satisfactory colouring.

(e) More than double the length of black and white.

In projection:—

(f) Special projector.

(g) Colour fringing.

(h) Fugitive colour screens.

(i) Frequency of "off colour."

(j) General "reddish" or "greenish" appearance of many of the pictures.

(k) Flicker, flicker, flicker.

(*a*) Lack of Exposure.—The camera shutter was about a half (180 degrees), the same as the average black and white camera; the speed was over 32 (more than double that of black and white). The exposure factor of the colour screens was from 10 to 14 times. Thus the camera man was forced to work under odds of at least 20 to 1, as compared with black and white.

This in practice meant working at full aperture (*f*/3.5) in sunlight, and in most countries only in the brightest time of the year. Perhaps to the uninitiated it does not appear a very great hardship, but it actually means a great limitation of subjects, and more than doubling or tripling the cost of

obtaining good negatives; under-exposed negatives, that in black and white would "get by," are useless in colour work.

(*b*) Irregularity of Panchromatic Stock.—In those days Kinemacolor had to manufacture their own stock by bathing black and white negative film in colour-sensitising solution, and it was no sinecure.

The negative was wound on 200 ft. pin frames. Usually three frames were run in each freshly-made-up dye bath. To compensate for usage of dye succeeding frames were left longer in the solution. The frames of dyed negative were then washed for a few minutes, the film wound on drying drums (in the dark), and dried.

Only those familiar with colour-sensitising dyes that are diluted to 1 in 50,000 to 1 in 100,000 can appreciate the cleanliness and freedom from foreign matters that must attend all operations, and it is indeed a wonder that Kinemacolor manufactured in quantities as good a product as they did.

(*c*) Alternate Exposure of Red and Green Images.—The method of obtaining the colour negative was on the principle of that patented by Lee and Turner (British, March, 1899). The latter, however, employed three-colour records. Smith went one better by using one less, and Smith and Urban took out a patent in 1906 for simply two alternating colours, roughly dividing the spectrum into two parts, using the complementary colour screens approximately red and green. The discovery of new dyes made possible for Kinemacolor what was impracticable in the days of Lee and Turner.

The camera employed was rather monumental, and, as the specialty of Kinemacolor was outdoor scenics, the work was hard on the camera man, reducing the output and increasing the cost of the negatives, I therefore had constructed a small Debrie model embodying the colour shutter. This model was adopted by the English and American Kinemacolor companies and gave satisfaction—especially to the camera-men.

(*d*) Perfect Positive Print.—It was very necessary to produce a clean, snappy print, developed exactly to the correct point. Any variation from this resulted in a totally different colour picture on the screen; unless a very skilled workman was employed the scrap heap again gathered up its spoils—complete harmony was necessary between the man at the printing machine and those who developed.

(*e*) Double Length.—As it took 2 ft. of film to show 1 ft. of action, cost of raw material was doubled, and lively action was necessary in the projection.

(*f*) Special Projector.—The high speed called for by the process necessitated a very robust projector, and it was provided with a revolving colour screen mounted on "ball" bearings, of which the maker was very proud. Although announced to run colour films or black and white, it would not handle the latter in a manner satisfactory to a showman with a conscience. At black and white speed there was *some* flicker. Therefore the man who wanted to show Kinemacolor had to install another machine in his already cramped booth, lay on more current, and engage an operator trained not to run away when this roaring film eater started up. A man with a weak heart had no chance.

Often 80 to 100 amperes of current, 40 to 50 pictures per second, and, when breaks occurred, if you were not very lively, you would be buried up to your chin in coiling celluloid. No wonder the Kinemacolor operators wore badges proudly; they deserved them.

(*g*) Colour Fringing was naturally the outcome of the method of recording the negative. If Kinemacolor had kept to scenics, for which it was adapted (who does not remember "The Lake of Como"?), this eyesore would never have been noticed, but familiarity breeds contempt, and when bold barons fought and fair maidens danced they were all wreathed in gaudy ribbons of red and green, which, however, in the maypole dance was very effective and always brought applause.

(*h*) Fugitive Colour Screens.—The colour screens on the projector were of ordinary coloured gelatine, and under a heavy amperage in a long programme became partially faded, causing a considerable variation in the colour rendering on the screen.

(*i*) Off-colour, or lack of synchronism between the colour values of the film and the colour shutter, was frequent, depending on the skill of the operator and the care with which the film was joined up. For unless a red image was always adjacent to a green image in a joint, the blue sky would suddenly become red, and green roses were far from rare. It was then necessary to stop the projector and "change colour," a very bad feature in showmanship.

(*j*) Reddish or Greenish Pictures.—Frequently a picture was spoiled by showing a pronounced tone, favouring either the red or green, caused by under-exposure, irregularity of panchro negative; or the blame attached to the camera-man for not carefully "balancing." The Kinemacolor camera-man had to be trained to his work, and one of his duties was to "balance" his colour shutter to the particular sensitiveness of his negative stock.

This consisted in photographing with his camera, and through the colour screens a white or grey surface, and developing the trial strip. If the colour screens and the colour sensitised negative were in accord, the red and green records showed an equal amount of density. Should the red image show a deeper intensity than the green, then the camera-man knew that the negative was "on the red," and he forthwith pasted a segment of black paper over his red colour screen to reduce the time exposure. Several trials were often necessary to find a good balance correctly; on this depended correct colour rendering.

To be absolutely correct this operation should be conducted under the same lighting conditions that would occur when the negative is exposed, for the composition of the sun's rays change with different localities, and in different hours of the day. It was naturally impossible for the camera-man to balance every roll of negative, therefore, many negatives were made that were not correctly balanced. To remedy this I invented a "Compensating" printer, provided with a sliding scale, which enabled one to add or subtract either colour value in predetermined quantities. This it successfully did, over quite a wide range, and many a negative was saved from the scrap-heap.

These "Compensating" printers were manufactured for me by Debrie, and were adopted by both the English and the American Kinemacolor companies.

(*k*) Flicker. I think it was this blemish that, more than any other, strangled Kinemacolor, for unless the pictures were of soft or dark tones, the speed of projection such that it made your hair stand on end, and the stage draped to kill reflections, there *was* an awful amount of flicker causing eye-strain, and more apparent was this to any one entering a show whilst it was running. Even the wonderful stagecraft of the Scala Theatre could not always conceal this; but why, oh why, did the girl with the red parasol always wander on the picture just as you were admiring the soft tones of a smiling landscape?

There was no remedy for this flicker, for when the bright red alternates with black, both having the same length of impressions, it is not a speed of 32 or 42, or even 52, that will smooth out a large area of these alterations.

When the unfortunate limitations of Kinemacolor were not strained, and only subjects taken that lent themselves to the conditions imposed, the results were truly wonderful, and I remember the late Professor Lippmann—one of the earliest workers in colour photography—coming round to the projection booth requesting to see with his own eyes that only two colours were actually employed. He did not believe it possible that such a combination of tones and shades could be obtained in this manner.

Having had unusual facilities for studying the disadvantages under which Kinemacolor worked, I set to work to try

and remedy as many of these as possible, and the new experiences I gained, if set forth, may save other workers both time and money.

My experiments were confined to sensitising, colour-screens, exposure, and improvements in projection apparatus, as these elements have immediate bearing on increased exposure, wider recording of colour values, colour pulsation or flicker, colour fringing, smoothness in working, and greater latitude in all chemical and mechanical operations.

CHARLES RALEIGH.

(*To be continued.*)

APPARATUS FOR THE DEMONSTRATION OF ADDITIVE COLOUR MIXTURE.

AN ingeniously-designed piece of apparatus for the demonstration of the effects of the mixture of coloured lights is described in the Festnummer of "Photographische Korrespondenz" by Professor John Herzberg, of Stockholm.

As illustrated in the diagram, the apparatus serves to show the formation of white light by a mixture of red, green, and blue-violet, and also of all the other colours of the spectrum. It consists of two circular transparent discs A and B, which can be rapidly rotated by means of the wheel D, through the cords SS. Each disc contains three sector-form light-filters R, G, V (red, green, and violet), consisting of stained gelatine mounted between mica sheets. In the case of A, the sectors are fully open, whilst in B the filters are of the shape shown in the figure. The discs have a diameter of about 3¼ inches, and thus can be projected on to the white surface of a projection screen by means of an ordinary optical lantern.

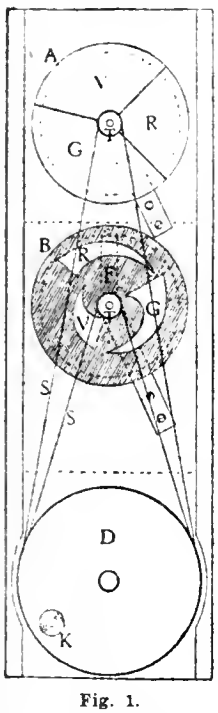


Fig. 1.

The filters are so chosen, and the angular measure of the sectors so adjusted, that perfectly white light is obtained on rotating the disc A.

Owing to the fact that blue and green dyes are never perfectly pure in colour, but more or less mixed with black, it is not possible to make a blue-violet, and still less so a green, filter which is sufficiently saturated and yet avoids degradation of the mixture. In order to compensate for the reduction which is the result of this mixture with black, the sectors are made of different angles. The red filter, which is the purest, is made 90 deg.; the green, 150 deg.; and the violet, 120 deg. If each sector is made of the same angle, *i.e.*, 120 deg., it is not possible to obtain a colourless mixture if it is also required that each sector filter shall be so saturated that it is completely extinguished by a filter of complementary colour without appreciably lessening the intensity of the other sectors. This latter requirement is of importance in the case of the apparatus for demonstration purposes, hence the design of the sectors as described.

For cutting out one sector in order to show the effect of mixture of the other two, the simplest plan is the use of a filter (absorbing the light to be cut out) on the projection lantern. Six selective filters were prepared for this purpose, and were so adjusted that each one absorbed two of the sector colours. If, for example, a yellow filter is used on the lantern, violet is absorbed and red and green transmitted. The originally violet sector then becomes completely black on the screen, and on rotating the disc, yellow results from the additive mixture of the red and green. Similarly, the green can be cut out with a purple filter and the red with a blue filter, the mixture of red and violet then giving purple, and that of green and violet, blue. The action of the selective filters used in three-colour photography can also be demonstrated; the orange-red filter transmits only the red; the green, only green; and the violet, only violet.

The disc B serves to show how the spectrum colours can be obtained by the mixture of any two colours. As shown in the figure, the sectors are partly covered, so that on rotating the disc the filters are gradually cut out from the centre to the circumference by the increase and decrease in the angle. In this way all colours of the spectrum from red to violet are produced. In the extreme red and extreme violet, as also in a very small green region, the particular filter colour is obtained without admixture. Hence in the regions near the middle or edges only parts of red or violet are respectively transmitted, according to the successive reduction of the angle of the sector, and thus a reduction of intensity of the outer colours is produced, causing them to merge gradually into darkness. The dull red corresponds with the extreme red of the spectrum; in proportion as green begins to enter into it, the colour passes gradually into orange and yellow. As the red falls off, the colour becomes yellowish green, passing to pure green as the red is eliminated, and giving blue-green and blue as the violet component comes increasingly into operation. Finally, as the green increases, the colour passes to indigo and violet. With the screen B in rotation there are thus seen on the projection surface concentric rings of colour, shading one into another, of all the colours of the spectrum. In order to obtain a more distinct representation of the spectrum as it is seen, for example, in the spectroscope, the apparatus is fitted with a sliding metal plate, provided with rectangular aperture F, as shown in fig. 1. When the aperture F is in the position shown in fig. 1, a band in the colours of the spectrum is produced by rotating the screen.

The filters for screens A and B contain the dyes mentioned below. The figures after the name of each dye are the number of grammes of dye per sq. metre of surface.

Violet filter: Passes violet and blue to about 498 $\mu\mu$; contains crystal violet, 1.5; toluidine blue, 1.25.

Green filter: Passes green, yellow-green, and yellow from about 498 $\mu\mu$ to 605 $\mu\mu$; contains naphthol green, 1.15; patent blue, 0.2; and tartrazine, 1.25.

Red filter: Passes orange and red to about 605 $\mu\mu$; contains Echtrot D, 10, and tartrazine, 15.

The six above-mentioned selected filters contain the following dyes:—

Yellow filter, absorbing the violet sector, tartrazine, 10.

Blue filter, absorbing the red sector, toluidine blue, 3.

Purple filter, absorbing the green sector, Rhodamine, 3, and Gentian violet, 0.15.

Orange-red filter: Absorbing green and violet sectors; Rhodamine, 3, and tartrazine, 10.

Green filter: Absorbing red and violet sectors; rapid filter yellow, 8, and toluidine blue. 3.

Violet filter: Absorbing the red and green sectors; Gentian violet, 3, and toluidine blue, 3.

The dyes used for these filters were those of Meister, Lucius & Brüning.

The chief difference between the colour mixture in the apparatus and in the methods of colour photography of Ives, Miethe, and others is that in the former the components follow in rapid succession, whilst in the latter they are presented simultaneously to the eye by projection or in the form of the various screen-plate transparencies.

SCREEN-PLATES WITH DIVISIBLE COLOUR ELEMENTS.—According to the specification of a patent No. 180,323, open to inspection but not yet accepted, S. Schapovaloff, 43, Waldheimstrasse, Berne, Switzerland, has devised a screen-plate process in which a support provided with a thin panchromatic sensitive coating carries between the coating and the support a screen of transparent elements. Each element is so coloured that a part of its colouring material is removable after exposure, for example by washing in water, by the action of light, or by chemical action, in order that the remainder may be weak enough to give the correct colour rendering when viewing the finished picture. The support may consist of glass, paper, or celluloid. The colour elements may consist of gelatine or rubber in the form of granules, flakes, or lines, and are preferably coloured twice with different colouring materials of the same shade, one permanent and the other temporary. A coloured transparent picture to be copied may be exposed through the support and screen. After developing and fixing, and the removal of the temporary colouring material, the support with its coating may be attached to white paper having an adherent surface. For transparencies, the permanent colouring material is of greater density than for non-transparencies.

No. 190. VOL. XVI. SEPTEMBER 1, 1922.

THE BRITISH JOURNAL OF PHOTOGRAPHY

MONTHLY SUPPLEMENT

ON

Colour Photography.

CONTENTS.

A ONE-EXPOSURE THREE-COLOUR CAMERA

To those who look for a form of colour photography of greater simplicity than the sensitive screen-plate it may seem late in the day to design cameras and viewing apparatus such as greatly occupied the ingenuity of inventors thirty or more years ago. Nevertheless, a French experimenter, M. C. E. Bredon, has recently described in Patent No. 148,789 a photochromoscope and camera in which the three negatives are taken simultaneously. A single meniscus front element is made to serve for use in conjunction with three separate rear elements, prisms being employed to obtain three separate images. The apparatus is adapted for viewing the additive colour effects as well as for making the colour-sensation negatives.

The apparatus comprises three optical systems; one for each of three images which are projected on to a single sensitive plate and the invention resides in the combination of three lenses, an optical diaphragm having an aperture common to all three lenses and corresponding in size to the normal utilisable opening of each lens and two total double-reflection prisms, fixed against the inner face of the diaphragm, one on each side of the axis of the opening, so that each prism covers up a part of the diaphragm aperture and a space is left between the opposing edges of the prisms.

The luminous rays entering through the diaphragm aperture are divided by this arrangement of prisms into three bundles; the middle bundle passing, between the two prisms, direct to a central lens and the outer bundles being respectively translated to the two outer lenses by double total reflection in the prisms. It is a feature of the invention that the rays of light so reflected to the outer objectives, impinge on the latter exactly as the

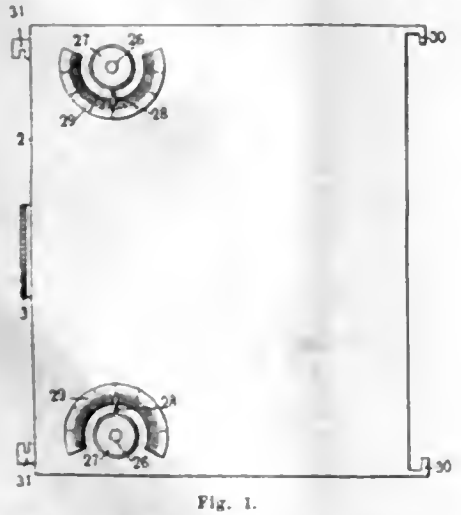


Fig. 1.

same rays would impinge on the central objective if they were permitted to reach it; hence the images produced on the two outer sections of the sensitive plate and the image produced on the middle section are absolutely identical in form.

The three bundles of rays which form these three images pass respectively through blue, green and red selecting screens before encountering the panchromatic plate.

Means are preferably provided for rendering the two prisms adjustable so as to permit regulation of the proportions of luminous rays passing through each selecting screen.

In the drawings, it will be seen, on reference to fig. 2, that

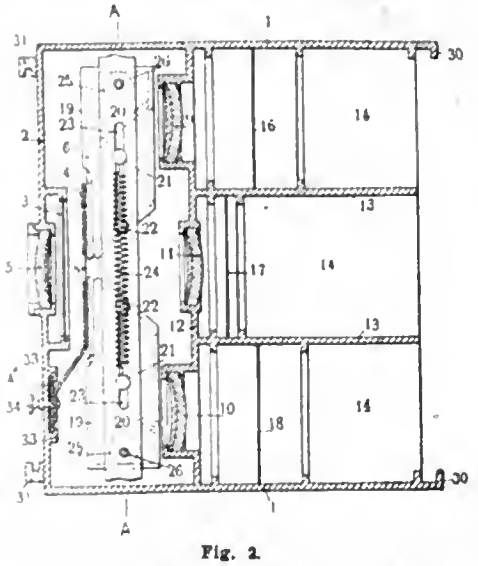


Fig. 2.

the body 1 of the camera carries, on its front plate 2, a shutter 3, a diaphragm 4, serving, as explained below, for taking the views as well as for examining positives, and a front lens 5.

Within the body 1 and in contact with the rear face of the diaphragm 4, are arranged two prisms 6 and 7 with parallel faces, the edges of which cover respectively the upper and lower parts of the circular opening 8 of the diaphragm, so as to reflect marginal bundles of the rays passing through the front objective 5 and to bring these bundles of rays, respectively, opposite each of the objectives 9 and 10. The rays passing through the middle zone of the front objective 5 and traversing the corresponding part of the circular opening 8 also pass freely through the gap between the opposing edges of the prisms 6 and 7 and directly encounter a central rear objective 11.

The three optical systems comprise a converging meniscus

lens 5, common to the three lenses 9, 10 and 11, which are also formed by converging meniscus lenses carried, at a suitable distance apart, by a partition 12 located in a plane at right angles to the optical axis of the front lens 5. The optical characteristics of these lenses are so co-related that the front lens 5 forms with any one of the rear lenses 9, 10, or 11 a system which is substantially free from optical distortion.

The body of the apparatus is divided by partitions 13 into three rectangular chambers 14 located respectively opposite each of the lenses 9, 10 and 11.

Each of the compartments 14, thus formed, contains a selecting filter 16, 17, 18 interposed between two glass plates and through these screens pass, respectively the three bundles of luminous rays, of which one bundle is filtered by a blue screen, the second by a green screen, and the third by a red screen. Thus, on one and the same sensitive plate, there are produced three separate negative images, identical in form, but differing as regards the colour values recorded on them.

The prisms 6 and 7 interposed between the front lens 5 and the rear lenses 9 and 10 have each an acute angle of 50 deg. They are made of flint-glass or other substance possessing sufficient refractivity to compensate for the difference in the distances from the diaphragm 4 to the central objective 11 and to the objectives 9 and 10.

However, except by employing very dense flint-glasses, the use of which should be avoided on account of the somewhat rapid alteration to which they are subjected, owing to oxidation on exposure to the air, the total compensation necessary could not take place, if the objectives 9, 10 and 11 were located on the same plane, without increasing to an inconvenient extent the distance from these objectives to the diaphragm.

The height of the prism is, on the contrary, reduced to the minimum, so as to diminish, correspondingly, the distance which the rays have to travel within them and, at the same time, the central objective is set back sufficiently to ensure exact compensation.

As the result of this arrangement, the objective 11 is brought nearer to the sensitive plate than the objectives 9 and 10, but correct focussing of all three images is re-established by means of the glass plates containing the selecting screens 16, 17 and 18; the thickness of the glass plates through which the rays pass being calculated in such a manner that each image is in focus on the same plate.

The three selecting screens, which, as stated above, are arranged behind the objectives 9, 10 and 11, consist of three sheets of gelatine, coloured, one blue, the second green and the third red, each being cemented between two glass plates.

The prisms 6 and 7, which as above stated, divide the circular

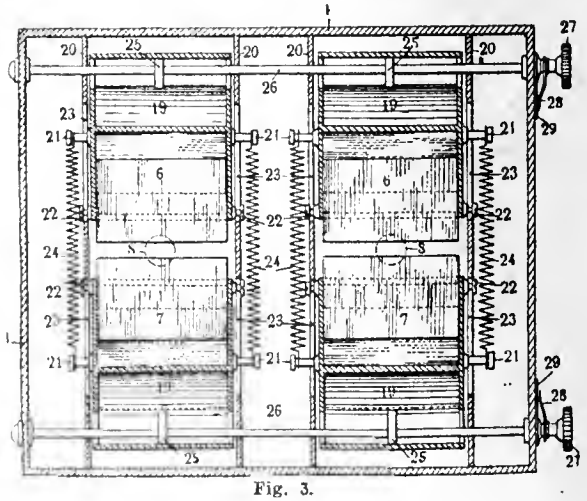


Fig. 3.

opening of the diaphragm into three portions, can move parallel to the plane of their front faces so that it is possible to vary, at will, the size of the portions of the opening which they overlap respectively. This adjustment provides means for controlling severally the intensities of the three bundles of light passing through the objectives 9, 10 and 11, thus permitting the use of any panchromatic plate having any proportions of sensitiveness to the different colours.

For this purpose these prisms are supported by mountings 19, each suitably held between two posts 20 fixed in the body of the apparatus, the connection being made by means of screws 21 and 22 engaged in slots 23 formed in these posts, so that the screws can slide freely in the slots and thereby operate to ensure accurate rectilinear guiding of the prisms.

The displacements of the mountings and of the prisms, which latter are constantly urged towards each other by coil springs 24

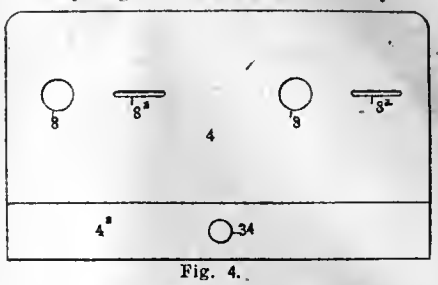


Fig. 4.

attached to the screws 21, are obtained by means of eccentrics 25, rigidly secured on spindles 26, carried by the body of the apparatus.

These spindles 26 are each provided with an outer operating milled head 27 and with a pointer 28 moving on a suitably graduated dial 29, so as to permit of exact determination of the positions of the prisms 6 and 7 and to provide means for giving them the position which corresponds to the characteristics of a given plate.

The apparatus thus constructed is provided at the back with guides 30, adapted to receive either a plate-holder or a magazine holder, or, when it is desired to examine the views, a positive holder, in which are inserted the positive views on glass; on the other hand, it is provided on its front face with guides 31, engaged by corresponding members on an eye-piece used for examining positives in the same apparatus.

The stereoscopic apparatus employs a single plate of a standard size on which are simultaneously printed six images of the same subject (three for each eye).

For this purpose, it comprises two entrance objectives 5, behind each of which is presented, as explained below, either a circular opening 8, or a longitudinal slot 8a in the diaphragm, the latter slot being intended for use only when the apparatus is used for viewing positives.

Behind the circular openings 8—assuming that the device is being used for taking negatives—are mounted, in the manner described, the two series of prisms 6 and 7 (see fig. 3) and, on the partition 12 (fig. 2) are two series of objectives 9, 10, respectively receiving the rays reflected by the prisms 6 and 7 and two central objectives 11 directly receiving the rays passing through the two front objectives 5.

The body of the apparatus is suitably partitioned at the back of the two series of objectives 9, 10, 11 so as to form six compartments, corresponding to each of the six objectives, and each containing a coloured screen.

The diaphragm for the stereoscopic apparatus is constituted, as shown in fig. 4, by two metal plates 4 and 4a, connected together, and the member 4a is inserted between two slides 33 on the front wall of the apparatus (see fig. 2). The whole of the diaphragm can thus be longitudinally displaced in the apparatus by means of the actuating knob 34, so as to bring opposite the front objectives 5 and the series of prisms 6 and 7, either the circular opening 8 for taking the views, or the longitudinal slot 8a provided in the plate 4 for the examination of the finished positives of these views.

The images obtained with one or the other of the above described apparatus are printed on an ordinary transparency plate, and in order to examine the positive thus obtained, it can be put in the place of the panchromatic plate into the apparatus in which the multiple photograph was originally taken, and the finished picture can there be viewed with the aid of an eye-piece engaged with the guides 31 on the front wall of the camera body.

When positives are viewed in the above-described apparatus, the colours seen through the screens which have been used for taking the views are perfectly true, whatever may be the light used for examination of the positives. In fact, the opening of the diaphragm being always divided in three parts by the edge

of the prisms, it is always possible, by suitably moving the latter, to effect any desired relations of intensity between the blue, green and red rays reaching the eye and to obtain, consequently, an exact reproduction of the colours, whatever may be the source of light employed. The same means may also be used to mitigate defects caused by incorrect exposure of the plate

REMINISCENCES OF COMMERCIAL COLOUR CINEMATOGRAPHY—ITS POSSIBILITIES.

(*Continued from page* 32.)

Sensitising.—I finally adopted a light revolving drum upon which was wound, automatically and absolutely equally spaced, the negative to be sensitised.

This drum, after slowly revolving in a fresh dye bath, was swung over radially into the washing water, revolved in this, and then made to take a vertical position midway between the two baths, locked in position, and rapidly spun above a current of warm air that impinged upon it.

The process proved rapid, clean and automatic. A small amount of dye bath only being required, it was possible to renew this at each operation, and a more standardised product produced, the film not being touched in any of the intermediate operations carried on in complete darkness, the drum motor driven at a slow or fast speed at will.

This same arrangement installed on a small scale to carry about 10 ft. of film, permitted me to economically make many hundreds of experiments, varying the mixture of dyes, their dilution, and study the addition of other re-agents for the purpose of increasing the ultimate rapidity and keeping qualities of the colour-sensitised negative.

The dyeing by this method was regular, and the time occupied for all operations the minimum.

Fortunately at this period Messrs. Eastman placed on the market a reliable panchro-negative film that fulfilled all commercial requirements, almost correctly balanced for standard two-colour work employing the paired screens of Messrs. Wratten and Wainwright, and I was therefore enabled to turn my attention to other problems.

The Eastman product had the colour dye incorporated in the emulsion, all tins in the same numbered "batch" appeared absolutely alike in "balance," it being necessary only to check up each batch—except in case a considerable time had elapsed since its manufacture; then a new balance had to be struck.

When old, it resensitises readily, and the result is usually more rapid than the original stock, but care must be taken when resensitising to employ a mixture of dyes that will bring up the colour-sensitiveness to a near balance, for the losses in colour-sensitiveness in old stock are not equal as regards the complementary colours.

The colour-sensitiveness of negative should always be as close as possible to a balance with the open colour screens, as any balancing by cutting out one or the other colour reduces the general rapidity.

I would warn experimenters, when dyeing ordinary stock, that all emulsions do not readily colour-sensitise. I have come across large batches that would not sensitise.

I would advise against attempting to sensitise if the marketed stock can be employed. I have seen hundreds of thousands of feet of the latter exposed and rarely a fault to be found.

Colour Screens.—To obtain better colour reproduction I made thousands of trials, spread over two, three, and four colour separation. I think I have investigated every reasonable combination possible, the lack of suitable scientific instruments forcing me to work by a process of elimination, the result on the projection screen alone determining.

In three-colour I tried a method employing the colours that are complementary to those used in the present-day three-colour photography, thus reversing the well-known process; the recording screens were minus red, minus green, and minus blue, obtaining often good colouring with very much increased exposure, but the multiple of three being difficult to handle decided me to use a four-colour separation, consisting of two pairs of complementary colours (U.S.A. patent No. 1,122,455). I made hundreds of trials, each consisting of: Exposing on a test subject; printing a positive, which then, formed into an endless loop, was projected for any desired length of time, in conjunction with both two- and four-coloured screens.

The range of colours and tints obtained by this method, when a four-colour or even a two-colour cycle is employed in projection, is much increased, and most of the pictures shown by Prizma were the result of exposure under cycles of *four* differing colours arranged as two pairs of complementary, the negatives being transposed into the form of a *two*-colour dye-toned double-coated positive.

A little more care is necessary when balancing the four-colour screen with the panchro negative, the screen containing the maximum blue having to be watched.

Exposure. The question of exposure is of vital importance in colour cinematography. Normal colour screens of sufficient density to give the necessary amount of colour separation multiply the exposure from ten to fourteen times, and there are only two methods to overcome this—increasing the duration of exposure without changing the number of impressions per second, or radically altering the medium by which the colour separation is achieved.

The first method was one of easy solution. I had built colour cameras employing the Geneva movement with a pull-down fully covered by a quarter shutter (90 degrees), which is half that of the usual type of claw pull-down employed generally in black and white. This yielded at once 50 per cent. more exposure, and cut down the colour fringing to a minimum, for it shortened the interval of time between each exposure.

Very few Geneva movements will stand 32 per second without vibration. After several trials I found that the movement embodied in the Simplex projector gave every satisfaction, and the several cameras built for Prizma having this movement gave steady, sharp negatives, as their pictures show.

I tried several accelerated claw movements, but at high speeds the vibration was too much, even when the mechanism was carefully balanced.

The attempts to make cameras to stand this work with a one-tenth pull-down (36 degrees) also failed. I think the practical limit is reached at somewhere round 90 degrees.

The question of changing the *character* of the colour sensations separator proved much more difficult. The Lumière method of starch grains, the various colour line screens, or their equivalent, require even greater exposure or bring in a new series of complications.

After much patience I succeeded in finding and working out to a practical conclusion a novel method of colour separation, that, whilst fulfilling our definition of necessary colour rendering, gave an exposure that lies between black and white and that of normal colour screens.

I say "novel," because the U.S.A. patent office after first refusing the application for protection on the grounds of being "inoperative," later granted claims for a patent that on the face appears to be a "basic" one.

By repeating the first claim of the patent granted, the process is simply explained :—

"The method of recording colour values which consists in exposing a panchromatic emulsion to both coloured and substantially white light."

Instead of employing a standard colour segment, of, for instance, red, the new screen was composed of a composite segment that consisted of a red screen having a radial slot cut out in its centre. This open space is covered by a "K1" or "K2" colour screen. The green segment (in a two-colour process) is treated in like manner, the slots in both colours being absolutely equal.

Thus every single picture recorded by this means consisted of a colour impression *plus* a black and white impression, the "K" screens serving to filter out the excessive blue-violet rays.

One would imagine, as the examiners of the U.S.A. patent office did, that the "white light" impression would bury or block out the colour impression—it does so to the eye—but the latent colour values are there, and the negative when printed from gives by additive light-projection with normal colour screens, a smooth running picture, full of colour and of great sharpness, and when transposed to double-coated film by dye-toning the results can be judged by those who have seen the Prizma pictures that embody this principle in combination with that of the four-coloured method of taking as previously explained.

An orange photographed with normal colour screens, in bright sunlight, full aperture (*f*/ 3.5) gives for the red impression a nearly fully-exposed image, lacking slightly, however, in the deepest shadows. The green impression would be very faint and entirely lacking in details.

I have a negative of a close up of an orange, recorded with these composite screens. The objective was stopped down to *f*/8. Other conditions being the same, both the red and the green impressions show the fruit as a fully-exposed rounded form, the red impression appearing slightly stronger than the green, and yet on the projection screen the orange stands out in full-coloured relief, and of a much more natural hue than it would have been if recorded with a pair of normal colour screens at full aperture and same speed.

Strangely enough the theoretical calculation of what the exposure factor of these composite screens *should be* as compared with normal colour screens does not account for the practical difference gained in exposure. In actual experience extending over several hundred thousand feet of negative taken by this method of increasing exposure and retaining colour, I have found the all-round gain in visible exposure is beyond the figures arrived at by calculation. This may be due to the fact that when once the point of under-exposure is reached in colour-screen work the curve falls off rapidly.

Later research has shown me that the exposure factor can be reduced still further, and the colour factor increased by still other means, that I hope to indicate later.

In California I conducted a series of experiments in some of the largest black and white studios, for the purpose of finding the limitations in colour working, under practically black and white conditions.

Using thin sheeting as top diffusers, of sufficient thickness entirely to break up shadows, with lens stopped down to *f*/5.6 in sunlight, the composite screens recorded full exposure with good colour, employing Eastman's normal panchro negative stock.

I found the white reflectors, as usually employed in these studios, were useless for colour work. I therefore, after experimenting, made reflectors by coating screens with one coat of aluminium paint, followed by two coats of gold paint (light bronze). These screens proved of great utility, in scenes and in close ups, accentuating the colour and increasing the exposure, and were less objectionable to the eyes of the victims than the white ones. CHARLES RALEIGH.

(To be continued.)

AUTOCHROME LANTERN SLIDES.

THE very fact that a colour transparency is seen upon a much larger scale greatly widens the scope of the process in regard to the subjects that may be undertaken. Very much wider expanses may be included in the picture successfully than would be the case if the picture were to be viewed in its original size. It is well known that landscapes are particularly disappointing when viewed in this way, though, when projected, all the beauties of the original may be seen fully in evidence.

For an Autochrome transparency for projection a full (slightly over) exposure is necessary, coupled with a full development in the first bath. It is also essential to use a developing formulæ that will produce a very brilliant result in regard to colour, without producing an unwanted density. An Autochrome transparency that is over-dense is often fairly satisfactory when viewed in the hand if the *colours* are sufficiently brilliant, but such gives very poor results when projected upon the lantern screen. The Quinomet concentrated developer, issued and specially recommended by the makers of the plates, has no equal; and Rytol used as directed by Messrs. Burroughs Wellcome & Co. in "The Photographic Exposure Record," is also entirely satisfactory. The following formula recommended by Mr. A. B. Hitchins is also excellent for Autochromes required for projection. It produces a very clear, transparent and brilliant positive.

Metol	6.5 gms.
Soda sulphite, anhydrous	40 ,,
Hydroquinone	2.1 ,,
Potass bromide	2.5 ,,
Ammonia, .880	20 c.c.s.
Potass ferrocyanide (not ferricyanide)	4.1 gms.
Water	1,000 c.c.s.

Development should be very full, and the action should be allowed to continue for four or five minutes. The following reversing bath is recommended :—

Potass bichromate	4 gms.
Sulphuric acid	15 c.c.s.
Water	1,000 c.c.s.

Redevelopment should be carried out in a good light with the following at a temperature of not lower than 60 deg. F. :—

Soda sulphite (anhydrous)	21 gms.
Diamdophenol	6 gms.
Potass bromide, 10 per cent. solution ...	100 drops
Water	1,000 c.c.s.

Sufficient time must be given for the image to be fully out, the plate being left in the solution for four or five minutes. A clearing bath should then be employed; among the best is a 1 per cent. solution of bi-sulphite of soda, or, if the worker is in the habit of using the acid permanganate reversing bath, this may be diluted to a pale pink colour (about twenty times its own bulk of water), but the plate must not be left in this bath more than twenty seconds, or reduction of the image will occur. If the plate has been fully exposed and treated exactly as above the final result should be thin, though with the colours sufficiently brilliant for satisfactory projection as a lantern slide.

The worker may decide whether the plate (after clearing) is in need of any further after treatment. Reduction may be necessary if the plates are at all under-exposed, though it is unlikely that an under-exposed Autochrome will be ever satisfactory for lantern projection. If, however, it is decided to reduce the plate, Farmer's reducer may be used, or the reversal solution diluted with five times its own bulk of water is effective. It is more than likely, however, that the plate will need intensification in order to be brilliant enough for lantern projection. It must be kept in mind that though the colours may seem bright when viewed by transmitted light, the magnification of the image when projected tends to reduce the quality and brilliancy of the image to a greater degree than most photographers are prone to imagine. The Lumière pyro-silver intensifier is undoubtedly the best, for its specific effect is to increase the brilliancy of the colours. If the plate is already dense and the worker fears that pyro-silver may add too much to the image, the chromium intensifier should be used, as its action is more easily judged and controlled.

Few Autochrome workers to-day varnish their transparencies; but this should be regarded as essential when preparing Autochrome for projection, for it brightens the image, renders it more transparent, increases the brilliancy of the colours, and has a slightly protective effect. Previous to varnishing, the plate should be soaked in a solution of chrome alum. Spotting out should be done after varnishing, using transparent colours, and these should be applied very carefully. R. M. FANSTONE.

No. 191. VOL. XVI. OCTOBER 6, 1922.

THE BRITISH JOURNAL OF PHOTOGRAPHY

MONTHLY SUPPLEMENT

ON

Colour Photography.

CONTENTS.

REMINISCENCES OF COMMERCIAL COLOUR CINEMATOGRAPHY—ITS POSSIBILITIES.

(*Continued from page* 36.)

Projection Apparatus.—After many trials I adopted a Simplex projector, in its usual form, with a three-bladed shutter, or for still higher speeds the special form designed for the late American Kinemacolor Co., having a two-bladed shutter and a slower pull-down. These mechanisms are about the only ones that would stand up to the wear and vibration of over 32 per second.

I designed a colour wheel attachment that could be readily attached to any standard Simplex or Powers projector, these two machines being used in the greater proportion of the principal theatres in the United States.

For colour screens I dyed up thin fixed lantern plates, hardened the gelatine, cut them to segments and cemented them to thin cover glasses, and by employing only the highest class fast dyes, these screens gave superior results to the previously-employed gelatines, using less current, producing a sharper picture, and lasting sometimes for months.

I had constructed a mechanism that enabled the operator to "change colour" instantly whilst running at full speed, and a very clever job Casler made of this. I designed a simple addition that enabled the operator to thread up his projection machine always on correct colour and to the frame line. A round hole was punched in the centre of the first red picture of a reel, this hole being threaded on a movable pin that protruded from the aperture plate of the machine, and the operations of threading up continued. Upon closing the gate the pin retired and left the colour film in correct position as to colour and to exact frame line.

Although these alterations removed many of the objections that were associated with Kinemacolor, and the result on the screen was excellent, the process was not commercial, and the demand was for "colour in the film" and no fringing of colours.

One of the earliest workers who attempted to meet this demand was Fox, originally associated with Kinemacolor. He was bold enough to attempt the following:—

Fox took a Kinemacolor negative, and printed from this the alternating red impressions on a strip of ordinary positive, developed and toned it blue-green, waterproofed and recoated it with emulsion, printed the green impressions, tone-dyed them red, thus producing one of the first "colour in the film" positives. Later he varied somewhat his operations and built a camera with two lenses to avoid colour fringing, but came up against "parallax," and had a brand-new form of colour fringing which attached itself to stationary objects.

Arturo Hernandez-Mejia was one of the next victims. He invented or, at any rate, claimed to be the first who employed a double-coated positive film, the red colour values being printed on the one side, and dye-toned blue-green, the green colours printed on the other side and dye-toned red. He also employed at first, a celluloid base tinted yellow, to avoid confusion in printing and neutralise any excess of the blue rays of the arc in projection. A full account of this process and his hopes were published in the "B.J." of October 18, 1911.

Messrs. Eastman in a quiet way produced some samples of colour in the film, on double-coated stock. I think it must have been a kind of bait, for they then settled down to placing on the market a practicable double-coated film stock.

Prizma, after a study of the most promising methods adopted by the several workers of "colour in the film," selected that of Hernandez, and at that time, having strong financial backing, were enabled to build extremely accurate double printing machines, the credit of which belongs to Messrs. Mason, Kelly and Casler. They also constructed machines for the continuous automatic tone-dyeing of both sides of the film. They employed Eastman's double-coated stock and printed from negatives made with the Geneva movement camera and composite colour screens as previously fully described, and have for the last two years been experimenting to produce a non-fringe camera. They certainly had pluck, having sunk not far from three-quarters of a million dollars in cash in the chase after commercial colour cinematographic pictures.

The commercial value of a colour process cannot be determined by the appearance on the projection screen, even when the costs per foot are given.

A mixed programme may appear satisfactory as regards:—

(*a*) Variety of subjects, but you must know the conditions of exposure.

(*b*) Colour rendering—the results may be pleasing, but far from true.

(*c*) Sharpness, only when shown accompanied by rapid movements, can indicate the value of the optical system employed.

(*d*) Freedom from fringing can only be judged when the action of close up movement is normal, and not purposely slowed down.

R

It is necessary to analyse the conditions under which the product was made and exhibited, and, *above all*, know the quantity of negative stock utilised over a considerable time period, covering a variety of subjects, and the class of labour employed in the production.

Losses in colour work far exceed those in black and white, and are due to greater exposure factor, the chemical and mechanical process of dye-toning and unskilled labour.

The number of operations are increased, the limitations are greater, and the practice necessary is only acquired at the expense of time and material.

As regards the exhibition end, if the product is widely distributed, will it stand up to the wear and tear employed in the projection machines?

In most machines wear is purposely confined to the celluloid side of the film. Few models are constructed on principles that treat with equal care both sides. Therefore the free running under working conditions of a product that possesses two emulsion surfaces must be confined to those projectors in which an ordinary black and white film can be run (under working conditions) with either celluloid or emulsion side towards the objective, without damage.

Those who hope to succeed financially on a large scale must improve present *exposure conditions* by obtaining colour separation under methods having a less exposure factor than the present procedure, and these colour separations must be obtained simultaneously. The product, to have a maximum life, should carry the colour values on the one side, so that a celluloid surface can carry the wear of all manipulations and handling from manufacture to projection.

To those workers who are content to specialise only in subjects that lend themselves to the present common knowledge conditions, I would advise the taking up of the double coated positive already on the open market, avoiding the particular methods described in the latter patents. They can find plenty of means to dye-tone and produce many pleasing results.

There is usually much difference between what the patentee says he owns and what his specification limits him to.

Ten years ago dye-toning was a more complicated affair. I remember when it was necessary to use five or six different baths, with intermediate washings, some of which had to be very thorough. To-day it is possible to dye-tone in any colour, employing but two baths, the whole operation, including one rinse and one after-washing, requiring but twenty minutes, and this from a faint silver image. The process is very fascinating, and I have made many thousands of samples.

Starting with the well-known formulæ, and with a varied supply of reagents, it is not difficult to discover modifications and variations; one of the peculiarities of well-known formulæ is that one rarely gets satisfaction from following strictly the method given, and many such may be made to give excellent results with a little patience.

The chemicals employed in mordanting, and their order of mixing, have much to do with the rapidity of after-washing, as also the particular dye employed. Hypo should not be used for clearing; clear, bright-coloured images absolutely transparent can be obtained without it.

The variations of the working of dyes, even of the same colour, are very great, some washing out quickly with one mordant and not with another.

When mixing dyes to obtain a desired colour care must be taken that the mixture is one that gives uniform graduations of colour. Some mixtures favour one colour in the high-lights and the other colour in the shadows, which is bad for balancing, for it must not be forgotten that the complementary dye colours must balance in the same manner as was mentioned in making the colour negative, but in this case, being a subtractive method, the result must form a black.

Very interesting combinations can be obtained by combining chemical and dye toning. The variations in the result are infinite, the high-lights and shadows favouring different colours.

For experimenting with short lengths of double-coated positive, when desiring to dye-tone each side of a complementary colour, I found the easiest method was to protect one side temporarily with a strip of Johnson's adhesive plaster (india-rubber base) that can be obtained one inch wide, the ideal width, as it protects only the area inside the perforations.

In conclusion I would add that although many mordants and many dyes make satisfactory samples, it is not every one that will dye-tone in a commercial manner a long length of film, and wash out rapidly and evenly.

CHARLES RALEIGH.

BLUENESS IN AUTOCHROMES.

[In a recent issue of "Le Photographe" is a paper by M. Eugène Muller, read before the Photo-Club of Alsace and Lorraine, in which the author records his observations on the occurrence of a predominant blue tint in Autochrome transparencies, and of the means which he found effective for its avoidance.]

It was found that a particular batch of Autochrome plates of the year 1920 showed a marked bluish tint, an observation which occasioned the writer to go into the subject, although the existence of the tint was denied by MM. Lumière. In later work it was noticed that the Autochromes no longer exhibited this predominant tint, the reason for which was found to be that, by an error, a Von Hübl light-filter of greater depth than the standard one for Autochrome work had been employed.

As regards variation in the mosaic screen itself of the Autochrome plate, this is an unimportant factor, and M. F. Monpillard has already remarked that the cause of a predominant blue tint is to be sought elsewhere, namely, in a difference in the colour-sensitiveness of the emulsion. It is, of course, obvious that if the colour-sensitiveness for red-orange rays is diminished from any cause, the use of the standard light-filter will give rise to a predominant blue tint in the transparencies.

This blue tint may be corrected, or even completely avoided, by one or other of several means. As has been suggested by M. Schitz, the Lumière light-filter may be supplemented by one of the Wratten K1 screens, employed, in addition to the standard Lumière filter, for about one-quarter of the exposure. M. Monpillard has also found that the Auto J screen of his manufacture, if used in conjunction with the Lumière screen, for the whole period of the exposure, is satisfactory.

My own preference has been for the use of a single screen somewhat deeper than the Lumière standard. Having a variety of screens at hand, I made a series of tests by photographing the same subject successively with different screens. A white object was always included, since the rendering of white may be readily observed, and a screen is found to be correct if white is rendered as white. A range of grey objects of different depths was likewise included, since any predominant tint makes itself more evident over parts which should appear as grey.

As a result of these tests, made by using Autochrome plates derived from nine different batches of emulsion, it was found that in summer the Autochromes made with the standard Lumière screen gave a bluish tint, even when exposure was correct or in excess of the correct time. The tint shows itself more or less strongly

according to the variations of the emulsion, and also to those of the illumination at the time of making the exposure. This latter was examined with the "coloriscope" of Von Hübl, and was never found to be pure white. However, notable variations in the bluish colour of the prevailing light could be observed. As a general rule this blue coloration is less intense when the sky is pale blue, with some clouds or completely clouded, than when it is very blue. But on certain days it could be observed that the blue colour of the prevailing light was as intense with a lightly clouded sky as on another day when the whole sky was a strong blue.

Tests made with the Monpillard Auto J. screen, such as was adopted as a standard by M. Monpillard before the war, gave a prevailing yellow tint with the recent Autochrome plates which I used. The explanation of this unexpected fact has not yet been found. Likewise a prevailing yellow tint was obtained with a Von Hübl screen of much greater depth than the normal, the time of exposure being increased by slightly over 50 per cent. But the transparencies obtained, despite a slight yellow tint in the whites, are of more agreeable colour rendering than the colder results obtained with the standard Lumière filter. A screen such as this appears to be suitable for specially blue conditions of light, such as occur, for example, in the photography of snowscapes, where the shadows are very blue.

Of all the other screens which I have tested, the most notable is undoubtedly the Von Hübl filter, having a slightly greater depth than the standard. The time of exposure requires to be increased by about one-fifth. The depth of this screen is only a little greater than that of the standard. Looked at by reflected light (laid on a sheet of white paper), it appears identical with the standard Lumière filter and does not show the reddish tint of the normal Von Hübl screen. In fact, it appears clearer than this latter. But examined by transmitted light its colour is yellower than that of the standard Lumière and Von Hübl screens, which are identical in appearance when viewed by transmitted light. This arises from the fact that only the yellowness in the screen is greater, whilst the red is the same as in the normal Von Hübl screen. The following are the formulæ for the normal screen and for the B, as given by Von Hübl in his "Theorie und Praxis der Farbenphotographie."

	B screen.	Normal screen.
10 per cent. gelatine solution	38 vols.	40 vols.
Filter Yellow K, 1 : 200 solution	16 ,,	14 ,,
Solid red D (Echt-rot D Hoechst) 1 :2,000 solution	16 ,,	14 ,,

The coloured gelatine solution is flowed on to glass in the proportion of 7 c.c.s. per square decimetre.

With this somewhat deeper screen the transparencies obtained on eight different emulsions, out of nine which were used in the month of June, were free from bluish tint, both with a blue sky and with one which was completely clouded, whilst the same subject photographed at the same time with a standard screen invariably showed the bluish tint. The ninth emulsion differed from the others in that it yielded a bluish tint even with the deeper B screen of Von Hübl. On the other hand this emulsion required at least double the exposure as compared with the others exposed under the same conditions of light.

Whilst the bluish tint appears when the old standard screen is used for daylight exposures, such is not the case when employing artificial illumination from a light rich in yellow-orange rays and containing a sub-normal proportion of blue and violet rays. These latter, being less intense in comparison with the others, the blue tint does not appear. Transparencies made on recent Autochrome plates, using a Nernst lamp with the special Von Hübl screen, or Perchlora flash powder with the Lumière Perchlora screen, showed no trace of a blue tint.

EUGÈNE MULLER.

A TWO-COLOUR PROCESS OF ADDITIVE COLOUR CINEMATOGRAPHY.

[The obtaining of more perfect blending of colours, and the possibility of making colour films to normal artificial light, are claimed in a recent patent specification No. 183,150, in the name of Messrs. R. O. F. Humphrey and Claude H. Friese-Greene. The invention provides a rotating disc, having an aperture admitting white light, with which is incorporated a section or phase of blue filter, and also a red filter section. The red filter is graded in density, so that the densest end is slightly deeper in colour than the actual depth required by a filter of constant density. Exposure therefore commences, to light of low intensity but correct colour, and gradually increases in intensity as the shutter moves across the lens. The blue filter, which is used in conjunction with the aperture admitting white light, is intended to increase the colour value on the blue side. This filter can be varied in area or intensity to suit any particular conditions of light, or nature of subject. The positive pictures are coloured in the usual manner, those taken through the colour filter being tinted orange-red, and those exposed to white light with the colour phase, tinted blue-green. The resulting pictures may be shown at a speed more approximating that at which the usual black and white picture is shown. But it is suggested, that it is desirable in practice, to speed up the intermittent motion of the camera so as to lessen the time taken in moving portions of the film successively into position for exposure. This "quickening up" of the motion of the film allows the use of filters of large area, thus increasing the speed of exposure and reducing colour fringing to a minimum.]

The usual disc containing two apertures is utilised, and is rotated at half the speed of the shutter. One aperture allows the passage of white light with a colour phase, which may suitably be of a blue-green shade. The other aperture is filled with a transparent filter coloured for example a shade between yellow and red. The aperture allowing the passage of the white light with a colour phase, is preferably adjustable in area so as to obtain a balance with the colour filter. Such aperture may be sub-divided into two or more apertures, if desired, which further apertures are preferably disposed on the opposite sides of the line passing through the axis of the disc and the middle of the aperture containing the colour filter. The essential is that the total of the areas of the subdivided apertures should approximately equal the area of a single aperture when such only is employed.

By sub-dividing the aperture allowing the passage of white light with a colour phase into two or more sections, and by disposing two of such sections as close as possible to the ends of the aperture containing the colour filter, displacement is minimised between the two pictures taken during each revolution of the disc and, as a consequence, colour fringing in the projected positives is also minimised.

In practice, the best results are obtained by gradually diminishing the intensity of the coloured filter from one end of the aperture to the other, the exposure being made either first through the densest end of the filter or through the lightest end.

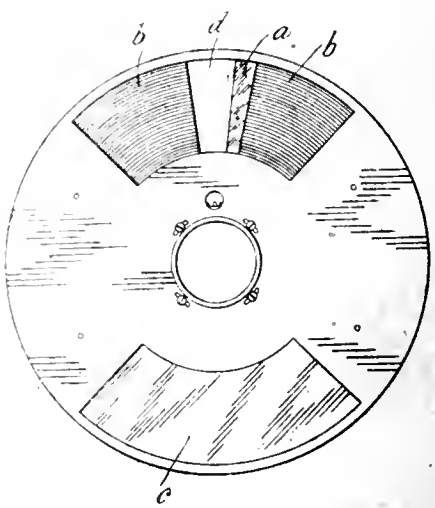
The gradual varying of the density of the colour filter is of great practical importance, inasmuch as it operates to reduce the period of exposure which would otherwise be required were the light passed through a filter in which the required colour was of uniform density. The colour at the densest end is slightly denser than the colour which would normally be required in a screen of constant density. The first part of the exposure is thus made with light of a low intensity, but of the required colour, which light then gradually increases in intensity as the aperture is moved across the path of the light passing through the lens.

It will be seen that the essential feature of the invention is the taking of one picture through a colour filter adapted to exclude white light but to transmit light at the red end of the spectrum,

and the taking of the other or succeeding picture by exposing the particular surface of the panchromatic or colour sensitive emulsion to white light with a colour phase which is of less value than the white light.

The positive pictures are coloured in the usual manner, the picture taken through the colour filter being tinted orange-red, and the picture taken by exposure to white light with a colour phase, being tinted blue-green

In the drawing *a* represents a blue-green phase, *b* a filling of



opaque material, and *c* a colour filter the colour of which is on the red side of the spectrum.

The following is one complete application of the invention when using the arrangement illustrated in the drawing.

Area of white light aperture = .6233 sq. inches.

Area of blue-green filter = .255 sq. inches.

The blue-green filter *a* is coloured with the following solution :—

Solution A :—

Rapid green	10 grs.
Distilled water	10 ozs.

Solution B :—

Patent blue	10 grs.
Distilled water	20 ozs.

These solutions are mixed as follows :—

1¼ ounces of Solution A and 1¾ ounces of solution B. To this mixture is added four ounces of distilled water.

The transparent filter material, preferably having a gelatine base, is immersed in the above solution for one minute, after which it is rinsed in distilled water for fifteen seconds and then allowed to dry.

Filter c is coloured by immersion in the following solution :—

Flavazine T	10 grs.
Distilled water	10 ozs.

The flavazine T is dissolved in the distilled water. The solution is applied to the filter material by means of a brush so as to obtain the gradual effect previously referred to in this specification.

The density and area of the colour filter c is determined by test so as to balance with the aperture for white light and the blue green colour phase.

The positive film is coloured by direct application of blue-green and orange-red colouring alternately, the blue-green being applied to the portion of the film corresponding to that portion of the negative which has been exposed to light passing through the white aperture and the blue phase and the orange-red to the portion of the film corresponding to that portion of the negative which has been exposed to light passing through the flavazine filter. One suitable solution for colouring the blue-green picture is as follows :—

Solution A :—

Rapid green	10 grs.
Distilled water	10 ozs.

Solution B :—

Patent blue	10 grs.
Distilled water	20 ozs.

To a mixture of one ounce of solution A and two ounces of solution B add two ounces of distilled water.

The solution for colouring the orange-red pictnre is as follows :—

Solution A :—

Fast red D	10 grs.
Distilled water...	11 ozs.

Solution B :—

Flavazine T	10 grs.
Distilled water	10 ozs.

To a mixture of three ounces of solution A and half-an-ounce of solution B add three ounces of distilled water.

TRIPLE COMPOSITE PLATES FOR THREE-COLOUR NEGATIVE MAKING.

THE old process of preparing three separate colour sensitive emulsions, coated on one support, their colour sensitiveness being so adjusted that three-colour negatives may be obtained at one exposure. introduced by the late Dr. J. H. Smith (English patent 19,940, 1904), and demonstrated by him befors the Royal Photographic Society, has been revived by a German inventor. This patent, No. 183,189, in the name of Ernst August Lage, provides for a plate for tricolour photography, which comprises three films placed upon one rigid support, which can be separated when required. The three separate sensitive surfaces are pressed into optical contact by means of rubber rollers, which press out the air between the layers, after the edges of the glass plate, used as a support. have been moistened. The combined plate can then be exposed as one surface, and when required for development the two separate films may be detached. The three sensitive surfaces are then developed in the usual way.

This invention provides for an improved method of producing photographic plates comprising three superposed colour sensitive films. Three silver emulsion colour-sensitive films (sensitized for the different spectral divisions) are prepared separately, are then superposed directly upon each other and are pressed into optical contact by pressing out the intervening air.

It is preferred to prepare one emulsion upon glass, whilst the other two emulsions are applied to very thin films. The films may consist of celluloid, collodion, coloured gelatine, mica, etc.

The thin films are placed upon the lower silver bromide plate, the intimate contact between the plates being produced by pressing out the air from between the films. A suitable mode of working is the following :—The emulsion side of the glass plate is wetted at the edge all round. The first film is then placed upon the table, with the emulsion side upwards, and the film, together with the plate, are then pressed against one another by one or more rubber rollers, which press out the air between the layers which are to be brought together. The second film is then superposed in the same manner, whereupon the plate is ready for exposing.

The lower emulsion which may be carried by the glass is a highly sensitive bromide emulsion sensitized for red rays; upon it lies a film sensitized for yellow, green and blue rays, whilst the uppermost film is sensitive to blue only. The filter layers, should any be required, are placed upon the rear sides of the emulsion carriers, preferably in the form of easily washed out colour layers of gelatine.

In order to develop the plate it is sufficient to make a slight incision upon the lower side along the edge. The several films are then easily separated, and may be developed and treated in the usual manner.

It would seem that the process described in the foregoing specification is that which contributes in part to the method which was recently brought to the notice of photographers at the trade exhibition in the Professional Photographers' Association Congress by the Peerless Photo-Paper Co., Ltd., of Rickmansworth. At that exhibition we learnt that the three-colour-sensation negatives are made at one exposure in an ordinary camera by means of a triple sensitive material which consists of two emulsion-coated celluloid films of extreme thinness mounted upon an emulsion-coated glass plate. That, however, is only half the process, since the Peerless Photo-Paper Co. have a method of their own of making a colour print from this negative set on a single sheet of development paper.

No. 192. VOL. XVI. NOVEMBER 3, 1922.

THE BRITISH JOURNAL OF PHOTOGRAPHY

MONTHLY SUPPLEMENT

ON

Colour Photography.

CONTENTS.

THREE-COLOUR TRANSPARENCIES BY COMBINED CHEMICAL TONING AND DYE PRINTING.

[At the recent exhibition of the Royal Photographic Society a medal was awarded, in the colour section, to a transparency by Mr. Frederic G. Tutton, who has now given working details of the process in the November issue of the "Club Photographer." By courtesy of our little Liverpool contemporary we reprint his paper.]

So much has been written and said about the making of a natural colour transparency by the Paget and Autochrome screen plate processes, that the average photographer does not know that there is another method whereby some of the most beautiful and brilliant transparencies can be obtained, and even in the lantern show upon the screen with a brilliancy not to be surpassed by either of the two methods mentioned above. This process is termed three-colour or tri-colour photography, and, in the author's opinion, results can be obtained, particularly against the light, that far surpass either of the present-day screen-plate methods.

As this paper is written particularly for the tyro who knows practically nothing about colour work, perhaps a short explanation of the theory of colour photography may help him to grasp the few essentials to success.

You probably all know how by means of a spectroscope the composition of white light may be studied, how on looking through this instrument a continuous band of colour is presented to the eye, commencing with red, through orange, yellow, green, blue, until finally violet is reached. You also have probably heard of the theory given by Dr. Thomas Young and Professor Helmholtz, namely, that all these colours may be formed from three fundamental or primary coloured lights—red, green and blue-violet. Tri-colour photography, then, is based on the principle that all colours occurring in nature can be split up into three primary or fundamental colours—red, green or yellow, and blue can be formed again from these. If the image of a coloured object is split up photographically into three constituent images, of which one produces only the yellow, another only the red, and the third only blue parts, these monochromes will, if properly superimposed, give a representation of the objects true to nature. To split up the image into the three primary colours, light filters or colour screens are used, and these screens are so adjusted that if in the path of the ray of light which forms the image on the plate a blue filter is inserted, it transmits all rays except yellow. In other words, the negative when developed will have the red and blue represented by a deposit, but the yellow, or any colour containing yellow, will be represented by more or less bare glass; thus the positive from this negative will only produce the yellow print. During the exposure, a green filter, which only transmits green, blue and yellow, but absorbs the red, is used. In the negative thus obtained, green, blue and yellow will be represented by a deposit, and red, clear glass. In printing we shall obtain a red transparency. Finally, to obtain the blue an exposure is made behind an orange or red filter, which transmits red and yellow and absorbs blue, the negative will show red and yellow dense and the blue clear glass, thus giving the blue positive.

Filters already adjusted can be obtained from most makers of panchromatic plates, and it is advisable to purchase the filters from the makers whose plate you decide to use.

Having exposed your plates behind the respective filters, the plates should be marked in some way—in the dark room, of course—so that when developed you will know which filter was used for the particular plate. In the author's own practice he always marks on the corner of the plate I. for red filter, II. for green filter, and III. for the blue-violet filter. The plates are always exposed in this order. Exposure should be full, so that details in the shadows are recorded, and the plates should be developed together at one and the same time. Development should be aimed to produce a fairly soft negative; hard negatives are apt to render the resulting transparency somewhat hard, with detail lacking in the high lights.

Now comes the part of the process where the skill and personality of the worker play an important part, and that is the making of the transparency. Personality is put here, as by the method to be mentioned the worker has it within his hands to alter, within limits, the result of the transparency, whether too much or too little of any one colour is required, or whether the whole is required to be brilliant or somewhat dull.

There are several methods of producing three-colour transparencies, but the one given below is about one of the simplest and most economical.

From the negative taken with the red filter a transparency is made in black and white upon an ordinary lantern plate; a somewhat denser image should be aimed for, as during the subsequent bath it loses a little in depth. It should be well fixed, and washed for at least half an hour in running water. It should then be placed in the following bath:—

Ammonium ferrous oxalate	8 grs.
Potassium ferricyanide	8 grs.
Glacial acetic acid	84 m.
Water	3½ ozs.

In this solution the image quickly assumes a blue tone. It should then be washed for a short time and immersed in an

... bath to remove the silver compound. Too ... is not advisable, as the bath attacks the ... and gradually dissolves it away. After well washing, it should be placed for one or two minutes in a 1 or 2 per cent. solution of hydrochloric acid; the colour is converted by this into a brilliant greenish-blue. The plate should now be washed in repeated changes of boiled or distilled water and dried.

To produce the yellow image, a positive transparency from the blue filter negative is made with films, using either the roll film variety or one of the flat films now on the market. If dried after fixing and washing, it should be thoroughly wetted and placed in the following bath:—

Stock Solution.

(A)	Potassium ferricyanide	124 grs.
	Water, boiled or distilled	3½ ozs.
(B)	Lead nitrate	124 grs.
	Water, boiled or distilled	3½ ozs.

Working solution A 1 oz. 6 drs., B 95 mins. Acetic acid, a few drops. This bath should be filtered if it becomes turbid.

The film should not contain the slightest trace of hypo, otherwise spots will form. The image will bleach out white, and then appears to be intensified to a notable extent, and for this reason the transparency should not be developed too strongly. When bleaching has penetrated through the emulsion, well wash until all trace of yellow stain has disappeared, then place in the following bath for a few seconds:—

Stock Solution.

Potassium bichromate	37 grs.
Water	3½ ozs.

Take one part of above to one part of water.

Wash again until all yellow stain has gone from the high lights, and dry. Varnishing this film with one of the transparent varnishes on the market renders the image more transparent.

It is in printing from the green filter negative for the red constituent image that rather more skill is required. Old and useless films should be fixed out in hypo with a little potassium ferricyanide to clear the emulsion from fog, well washed, and dried. They are then immersed for two minutes in the following solution at 60 deg. F.:—

Ammonium bichromate	27 grs.
Strong sulphuric acid	6 drops.
Water	2 ozs. 1 dr.

Rinsed in clear water and dried in the dark.

Printing is carried out in daylight until the image is well seen in a brownish colour; it is then removed from the printing frame, well washed for half an hour in frequent changes of water—not running water. The film should then be immersed in the following solution:—

Magenta red dye	16 grs.
Hot water	4 ozs.
Acetic acid	10 mins.,

for about twenty minutes, so as to give the chromated image plenty of time to take up the dye. Rinsing in water made acid with acetic acid until the high lights are clear of the dye completes the operation for the red film.

We now have three positives in their respective three colours, namely, blue upon the glass, and a yellow and red film, and all that now remains is to superimpose the three images on top of one another to complete the picture in all its natural beauty.

The blue slide is first placed in a retouching desk with the film uppermost; upon this is laid the yellow image, and moved about until the two images are in register; a little touch of seccotine is placed on the underside of each corner of the film, and the two pressed well into contact, a cover glass is laid over, and the whole put under pressure for about 24 hours for the glue to dry. Laying the yellow image should be done in daylight, as it is very difficult to see the yellow image during artificial light. We now have the picture in two colours, and if carefully superimposed no fringing of the colours will show. It now remains to fit the red over the green image, which is done in exactly the same way as with the yellow film, but in this case the picture will be seen in all its original colours; after cementing the corners and leaving to dry under pressure for 24 hours, the picture is masked and bound between a cover glass with lantern strips.

Anyone making these transparencies for the first time will be astonished at the results—shadows are transparent, high light with colour, and the resulting picture more or less under the control of the worker.

The above operations sound more difficult than the operation really is, and the author trusts that it may be the means of inducing many others to take up this branch of photography. The difficulties, if any, are easily overcome with a little practice and patience, and when once a fair start has been made, and the subject thoroughly grasped, there are but few who will have any desire to abandon the work.

FREDERIC G. TUTTON.

THE GORSKY CAMERA FOR COLOUR CINEMATOGRAPHY.

[The patent specification, No. 185,161, for the optical system of a camera for colour cinematography, invented by Professor S. M. de Procoudine Gorsky, and previously mentioned in the Colour Photography "Supplement" of January 6, 1922, p. 4, has now been published. This system consists of three rhomboidal prisms, cemented together to make one combination prism, which is arranged in front of three separate lens systems. Two of these prisms are coated with a reflecting band of silver, and thus three separate pencils of light traverse parallel optical paths, and are then taken up by the three lenses. As the distances which the rays travel are not equal, correction has to be made, either in designing the objectives or in adjustment of their focal lengths, but in a suggested modification to suit a camera taking three separate bands of film this is unnecessary. Three films in this adaptation are fixed at unequal distances from the prisms, so that the optical distances become equal. In a further modification of the system, two prisms only are used, as in fig. 3, and by this means it is claimed that a greater volume of light is allowed to reach the films. The novelty of this optical system is that the original image, received by the first prism, is split into three separate images before entering the lens system, and the corrections which are made for distortion, caused by the prisms, enables three identical images to be recorded on the sensitive surface.]

THE invention consists of an optical system for a photographic camera, comprising a series of rhomboidal prisms arranged in such manner that the light-rays from the object are reflected so as to form three identical images on three picture areas of a sensitive surface. The parallel faces of the prisms, which are coplanar, are provided with a substance having a refractive index differing from that of the glass, or a partially-silvered surface to act as a partial reflector. The reflected rays are passed through lenses situated at varying distances from the prisms and the sensitive surface of the film or films.

Fig. 1 illustrates a method suitable for the simultaneous production of three identical images upon one cinematograph film;

Fig. 2 illustrates a method suitable for the simultaneous production of three identical images upon three separate cinematograph films;

Fig. 3 is a modified form of the invention illustrated in fig. 2.

In fig. 1 the film passes through a gate frame, A, of the usual form having three apertures, A_1, A_2 and A_3, each corresponding to a picture area of the standard cinematograph film, and arranged to expose three successive picture areas. The film, B, is moved forward by intermittent mechanism, which is adapted to move the film forward at each shift a distance corresponding to three picture spaces. A suitable objective, C, is placed in front of each aperture, and in front of the objectives a prism, D, is provided comprising

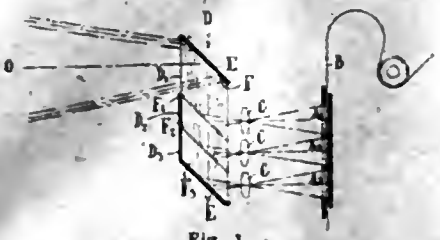


Fig. 1.

three separate prisms, D_1, D_2 and D_3, of rhomboidal section mounted in one frame, E. The separate prisms, D_1, D_2 and D_3, have one pair of their parallel faces coplanar. The rays of light radiating from the object, O, strike against a primary reflecting surface, F, of the prism and are reflected on to secondary reflecting surfaces, F_1, F_2 and F_3, which in turn reflect a certain proportion of the light-rays through the objectives, C, on to the film B. The secondary reflecting surfaces, F_1, F_2 and F_3 are situated at the face of each separate prism, D_1, D_2 and D_3, remote from the primary reflecting surface, F. In this manner three images are produced on the film, B, without lateral parallax.

As the distances the rays travel to each section of the film are not equal, corrections should preferably be made and the linear inequality or longitudinal parallax be compensated. By allowing for the correction of this distortion when designing or calculating the objectives, C, or by the adjustment of the focal length of the objectives, images of the same size are obtained, at the expense of clearness. One of the images may be probably of colour sensations not so accurately focussed while the others important in colour photography are slightly indistinct. It is obvious that owing to the necessity of compensating for longitudinal parallax the objectives, C, will move different distances when focussing, but always in definite relationship to each other. If desired this definite relationship may be maintained by mechanical means. Another form, illustrated in fig. 2, is an apparatus suitable for the simultaneous production of three identical images upon three separate cinematograph films. An optical system is provided of similar construction to that described. The difference is, that the objectives, C, and their corresponding gate frames and gates, A_1, A_2 and A_3, for the three films are arranged in planes parallel to each other, but at different distances from the central axis, G, of the combination prism. This arrangement enables the length of the path of the light-rays from the object to the films to be the same in each case

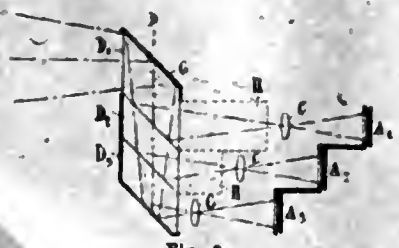


Fig. 2.

and thus eliminate errors due to longitudinal parallax. Another advantage is that objectives, C, of the same focal length may be used to produce identical images. The films are moved forward by intermittent mechanism, which in contradistinction to the previous example, is adapted to move the films at each shift a distance corresponding to one picture space.

As in the first example, the lengths of the paths of the rays in the prisms are different for each image, but in this case and a modification thereof, the degree of distortion is corrected by equalising the lengths of the rays in the substance of the prisms, D_1, D_2 and D_3, and the air in such manner that the length of the medium passed through is the same for the three images. This may be done by placing a correction component. H, between the prisms, D, and D, and the objectives, C, this component, H, preferably comprising a prism of suitable length and of the same material as the reflecting prisms, D_1, D_2 and D_3. In this case all three objectives, C, having the same focal lengths can have the same correction due to prism distortion. In cases, however, where absolute correction is not essential the correction of the objectives, C, for prismatic distortion can be neglected and ordinary photographic lenses may be used.

In a modified form, as illustrated in fig. 3, the prisms, D, may comprise two separate prisms, D_3 and D_4 of rhomboidal section mounted in one frame, J, and having one pair of their parallel faces coplanar. The prism, D_1, bearing the primary reflecting surface F (figs. 1 and 2,) may be eliminated and the prism, D_3, which corresponds to the first of the secondary prisms shown in figs. 1 and 2 may be adapted to permit rays to pass through the first of the series of objectives, C, on to the first film area, K. In addition to this a proportion of the rays from surfaces L and L_1 are reflected through the second of the series of objectives, C, on to the second picture area, K^1, and a second prism, D_4, which reflects by the surface, L_2, the rays through the third of the series of objectives, C, on to the third picture area, K_2. By reason of the surface, L, which corresponds to the primary reflecting surface, F (figs. 1 and 2), permitting rays to pass one of the secondary reflecting surfaces is eliminated, and thus more light reaches the sensitive surface of the films K, K_1, K_2. The regulation of the amount of partial reflection from the secondary reflecting surfaces and the penetrability of a proportion of the rays through the secondary reflecting surfaces may be carried out, by the provision at the reflecting surfaces of a substance having a refraction index differing from that of the glass, or by ruling a metallic or other suitable partial reflecting surface on the secondary reflecting surfaces. Thus a portion of the rays of light may penetrate the mirror, while others are reflected. The total reflecting surfaces of the prisms are, of course, plane

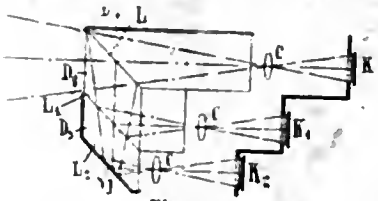


Fig. 3.

mirrors, and may either be silver-plated or simply blackened on their surfaces. When using ordinary photographic objectives the correction of the distortion of the images may be effected either by placing a sphere parallel lens or lenses in front of the system of prisms or in front of each objective so that the images are distorted, the distortion being such that when combined with that due to the system of prisms they will counteract each other. The lens which is referred to as a sphere parallel lens has curved surfaces which, if extended, would form concentric spheres.

Specially designed objectives may be used which correct distortion due to the prisms. In this case the three objectives used are calculated so that their focal lengths are corrected for use with light-rays of a definite wave length, corresponding to those rays passed by the light-filters used. Functions are also introduced for the compensation of chromatic aberration of the rays of the spectral area corresponding to the colour of the light-filters, but the general chromatic aberration of other rays is neglected. The prisms may be attached to each other by means of Canada balsam, which has a refractive index equal to that of the material of the prisms. The partial reflecting surfaces are protected and the light-filters are situated in suitable positions.

COLOUR PHOTOGRAPHY IN SMALL SIZES.

SINCE owing to the present high cost of colour screen-plates there is a tendency to work a smaller size, the 3½ x 2½ size may now be regarded as quite satisfactory. The picture, if cut down slightly, is quite useful for colour slide-making. Colour photography in these smaller sizes demands some precautions, and some notes upon these may perhaps be of service.

The 4½ x 6 cm. or vest-pocket size is almost too small for colour photography, while the saving in cost is not great when compared with the 3½ x 2½ size. Perfectly good work may be done with a vest-pocket Kodak adapted for plates, but there

is a difficulty in handling these in the dark-room. The Autochrome plate, even upon a minimum degree of enlargement, is inclined to show the coloured grains, while the image being small requires greater enlargement than transparencies of larger size. With the short focus large-aperture lenses fitted to these small cameras great depth of definition may be obtained without recourse to a small stop. The colours are also more brilliant when large stops are used.

One disadvantage with a small camera is that the slides may not be deep enough to accommodate the Autochrome plate with its black card backing, while they are useless for the Paget process even when the extra thin taking screens and plates are employed. Those workers who are equipped with the N. & G. double slides will find their equipment suitable in every way. The great danger with these small plates is frilling, which often occurs to a greater degree than is the case with the larger sizes. A defective edge of, say, a quarter of an inch may not greatly matter in those transparencies of quarter-plate size and over, but in the case of a 4½ x 6 cm. or 3½ x 2½ plate this may make a decided inroad upon the picture. Handling the plate with hot fingers is a very prolific source of the trouble. As a preventive I suggest that a metal frame may be constructed, into which the plate could be slipped from one end, the other end being curved upward to serve as a handle. With small transparencies, especially those intended for lantern projection, it is necessary to secure brilliant results. For some notes on this subject I would refer the reader to an article appearing in this "Supplement" for September, 1922.

I assume that most photographers who use the 3½ x 2½ size do so with a view to using their results as lantern slides. In the case of 3½ x 2½ plates it is not a difficult matter to cut a quarter-of-an-inch off one end of the plate, provided the worker is used to cutting glass and is possessed of a good diamond. If this is not the case, a glazier can be persuaded to do the job, but under the worker's personal supervision. A sheet of thick felt, upon which a piece of smooth velvet is laid, should be used for cutting on, the cut, of course, being made from the glass side. Great care is necessary to *break* the film and not to tear it.

To bind up the plate as a lantern slide proceed as follows:—Take a perfectly clean cover glass and lay the transparency film down upon this, exactly central. The edges of the transparency are then given a thin coat of "Seccotine," and the two plates are placed on one side until the adhesive is perfectly dry. The slide is then bound up in the usual manner, a fairly wide binding being used on the short side of the plate. If a 4½ x 6 cm. Autochrome is to be bound up, a slightly different procedure is necessary. The plate is placed in the centre of the cover glass, and the edges are gummed as before. Great care should now be taken that the Seccotine does not run under the edges of the Autochrome plate, as it is liable to attack the colours. When this plate is ready for binding it will be found that there is considerable space around the small Autochrome which requires filling in. This may be done by cutting pieces of cardboard of the necessary thickness and sufficiently wide to reach to the edges of the cover glass. These may be attached to the cover glass by means of Seccotine and strips of binding so affixed, that the junction of the cardboard and Autochrome is concealed. The slide may then be bound up in the usual manner, and will be found to present no difficulty when it is put through the lantern. In the case of small transparencies made by the Paget process, two methods are available. The easier, perhaps, is to make the small transparency upon an ordinary lantern plate, and use a full lantern size viewing screen. These may be bound up together without trouble; no special precautions are necessary. However, it may not be thought economy to use such a large viewing screen for so small a picture, and in the second method a screen of the size of the actual picture is used. This screen should be carefully adjusted into perfect register, and then held to the lantern plate by spring clips. Seccotine is then applied to the edges, and the whole allowed to become perfectly dry. Pieces of cardboard are then cut to the requisite sizes and affixed, as suggested above, for the small Autochrome plate. The slide is then bound up in the usual manner, and is ready for the lantern.

It should always be remembered, when making colour transparencies for lantern projection, that the most brilliant possible results be obtained. This particularly applies to the small sizes on plates we are now considering, as the slightest flatness or extra density will be fatal to good results when the slide is shown upon the screen. To this end the utmost care and cleanliness should be observed in dark-room manipulations, while the exposure of the plate itself must be most accurately estimated. If development, etc., is carried out with the aid of the metal frames suggested, there should be no reason to expect other than a good result as regards these manipulations, but it is quite apparent that unless the exact times necessary for the complete development, reversal, re-exposure, and re-development of the plate, in the case of the Autochrome, are observed, brilliant pictures cannot be expected. A difficulty often experienced in reversing the Autochrome image, and one which controls the ultimate brilliancy of the picture, is the second exposure to light. This, of course, takes place after the potassium permanganate bath has dissolved out the original negative image, and it should be observed that just sufficient light is used, and that of a suitable quality. It may be found that brilliant sunlight will cause reversal, more or less according to the time of exposure to the light. If this does occur, a flat lifeless image will result upon re-development. It should therefore be remembered that a too long exposure to daylight must be avoided, it being much better to use some artificial means of illumination. An exposure of a few seconds' duration to the light of a half-watt bulb of about 100 candle-power proves sufficient, but failing this one inch of magnesium ribbon at 2 ft. distance from the plate will suffice.

R. M. Fanstone.

DESENSITISING IN THE AUTOCHROME PROCESS.

In a paper read before the Photo-Club of Alsace and Lorraine M. Eugène Muller has some hints to give from his experience in the use of desensitising in the Autochrome process. He writes:—

As is well known, the reddish colour of gelatine film obtained by the safranine desensitiser is destroyed by the permanganate reversing bath. On the other hand, this colour is not removed when a reversing bath of acid bichromate is used. Those who have been accustomed to use the bichromate reverser do not seem to take kindly to the permanganate reverser, which they consider less practical. They are thus led to discard the safranine desensitiser and to use the aurantia desensitiser for Autochrome plates. While the yellowish colour produced on an Autochrome plate by aurantia is not destroyed by the acid bichromate bath itself, washing for 2 to 2½ minutes after the reverser is sufficient to remove the yellow colour.

The panchromatic emulsion of the Autochrome plate being only about half the sensitiveness of the Lumière Blue-Label plate, the degree of desensitisation obtained with aurantia is ample for development quite close to a 16-c.p. carbon-filament bulb used behind four thicknesses of yellow Virida paper. With this illumination there is no risk in examining the plate by transmitted light. Holding it 8 or 10 inches from the light, the instant of "extinction" of the image can be seen as readily as by green light.

In practical working, the plate is placed in the desensitising bath in complete darkness, after which the yellow light can be immediately used, if the precaution is taken of using for desensitising an opaque dish (porcelain or xylonite) and covering it with a card or placing it in shadow. The protection of a shadow of a solid screen is sufficient for the transference of the desensitised plate into the developer. Working in this way, the handling of the plate in the dark is reduced to a minimum. The dark-room clock can be placed in the direct light of the lamp, so that it can be used with the greatest ease for timing both the period of desensitising and the factorial development of the plate.

In transferring the plate from the desensitising bath directly into the developer without rinsing, the latter becomes strongly coloured, but this colour does not prevent the solution from being used for the second development, even when exposure of the plate is made to electric light such as a 32- or 50-c.p. lamp. It is, however, advisable to expose the plate to the light for some seconds before applying the coloured developer and to rock the dish vigorously so as to uncover the various parts of the plate to the artificial light, or to daylight if that is used, during re-development.

It will thus be seen that when re-developing desensitised plates it is not necessary to use a stronger illumination than when re-developing plates which have not been desensitised. Apparently this arises from the fact that, as noted by Lüppo Cramer, desensitisation acts only on the surface of the emulsion grain, and that these surface grains are removed by the reversing bath.

Eugène Muller.

No. 193. VOL. XVI. DECEMBER 1, 1922.

THE BRITISH JOURNAL OF PHOTOGRAPHY

MONTHLY SUPPLEMENT

ON

Colour Photography.

CONTENTS.

THREE-COLOUR BROMOIL TRANSFER.

To the colour photographer who works those processes demanding three separate negatives each of a separate colour sensation, many different means of printing are available, and he may find much interest in trying the processes that have been suggested from time to time. One of the most interesting that I have tried is undoubtedly that which uses Bromoil methods to produce the resulting image in colour on the bromide print, but even this may be improved upon by working Bromoil transfer. Three-colour prints made by this means, providing careful attention has been given to all the details of the process, are extremely beautiful, and preserve all the delicate colourings of the original subject. The control which this process allows is of great help in the modification of individual colours, and after the worker has made one or two complete prints he will find that he is capable of producing a colour photograph in which careful adjustment of the various inks gives the effect that he desires.

The necessary negatives are made in the usual manner by exposure through blue, green and red filters upon panchromatic plates. In developing these, it must be remembered that they will be required for enlarging, and must consequently be thinner in density than those used for contact work. To obtain equal density, but, of course, varying according to the depth of colour, it is desirable that the three negatives should be developed in one and the same dish at the same time and with a fairly weak developer. I find the "B.J." pyro-soda developer, diluted with an equal volume of water, to be an excellent one which will give negatives of the required density in about 3½ to 4 minutes. The negatives when dry should be carefully marked with the name of the filter through which the exposure was made and also the colour of the resulting image, thus—blue negative yellow print, green negative red print, red negative blue print. This is a safeguard against error in printing, which is often difficult to rectify or even find out until the final print is made.

The making of the three bromide enlargements is the next procedure, and great care should be taken to ensure each print being of equal density and developed to the full extent of the exposure. It is best to use fresh developer for each print: by this, I mean that each print should have an equally strong developer, and not one that has been used previously. The best method is to make up three measures of solution. 4 ozs. is sufficient if whole-plate enlargements are being made—and use one measure for each print. Amidol, 3 grains per ounce, is a very good strength, and with the present makes of Bromoil bromide paper works very well, and gives good, deep prints. The time of development and also the temperature of the solution should be taken when developing the first print, and these conditions kept constant with the other two prints. It is most necessary to attend carefully to these details, since so much depends upon obtaining three prints of equal density and quality. The enlargements should be fixed in a plain hypo solution, 3 ounces hypo to 1 pint water, for ten minutes, and then washed for one hour.

The prints, when dry, are ready for bleaching, but should first of all be squared up and trimmed so that each enlargement is of exactly the same size and the image in the correct position. A good method of obtaining this equality in size and position of picture is to place the three enlargements on top of each other and view them by a strong transmitted light. They may now be exactly superimposed, and when this condition is obtained a pin is pushed through the three prints at each of the four corners of the picture. The prints may now be trimmed to these pinholes and so will be all of exact size, the image being in the same position in each print.

Any good bleacher may be used, providing it is not intended to be used in too hot a solution. However, it should be borne in mind that the temperature of the bleaching bath and wash water should be equally maintained in each instance. It is not necessary to fix after bleaching, the silver image taking no part in the final print. As it is only possible to ink one print at a time, it is therefore necessary to bleach each print as it is wanted, and no trouble will be experienced in this direction if all the prints are dried first. Personally I bleach the print which is to receive the yellow image, first, as I prefer this colour at the bottom of my finished result. The procedure of inking the print differs very little from ordinary Bromoil practice, but one has to bear in mind the strengths of colour in the original subject. The best way to do this is to make a note at the time of exposure, thus predominant yellow or predominant green, etc. I find this helps considerably in the inking, and allows of the increasing or subduing of any colour to suit the subject. The inks may be obtained from any dealer in printing inks, but they should be of the very best quality. The inks supplied for three-colour half-tone printing work very well; these should be ordered as tricolour red, tricolour yellow, and tricolour blue. Roberson's medium may be used for thinning if necessary, but usually the inks will be found quite workable as they are. The print from the blue negative is first inked in yellow pigment; I find it best to do this by daylight, as it is difficult to judge the extent of inking by artificial light.

When the print is fully inked it is ready for transferring. As the final support, any good quality of drawing paper with a fairly smooth surface may be used. This paper is first damped by being placed between wet blotting paper; it is then removed and placed upon a pad of dry blotting paper on a sheet of three ply wood. The yellow print is now laid face down on the transfer paper and a pencil line drawn around its edge upon the transfer. This acts as a guide for the other prints and allows easy registration. Several sheets of clean blotting paper are now placed on top, and over this a piece of printer's blanket, when the whole is ready for the press. An ordinary rubber-roller mangle or wringer works very well, but good pressure is necessary. The print should be passed through three or four times backwards and forwards, taking care that no stoppage occurs during the process.

The bromide is now stripped from the transfer, and it will be found that the latter now holds the ink. The next print to ink in the blue, from the red negative. It is usually found that the blue ink is very intense, and care should be taken that this print is not over-inked. Transferring takes place exactly as in the yellow print, care being taken that the edge of the print corresponds with the marks upon the transfer paper. Finally the red print is inked and transferred upon the other two-colour images, when, if care has been taken during the process, it will be found that the result fully justifies the amount of trouble taken.

H. H. FEATHERSTONE, F.R.P.S.

COLOUR CINEMATOGRAPHY WITH NON-INTERMITTENT FILM.

[Among the inventors who continue to attack the problem of cinematography in natural colours is M. Edouard Belin, well known as a successful experimenter in the telegraphic transmission of photographs. According to a patent specification, No. 157,196, applied for in Germany in 1914, under the International Convention, but only recently accepted in this country, M. Belin has designed a form of cinematograph camera and projector in which the film moves continuously. It is claimed for this pattern of apparatus that it provides the means for three-colour cinematography much more efficiently than apparatus in which the film is exposed, and projected intermittently.]

THE principle of the system will be understood by the following general description :—Assume A (fig. 1) to be a transparent cylindrical surface against which a film P is supported which carries a succession of positive pictures resembling the ordinary cinematograph films, whilst S is a powerful source of light provided with a condenser C and an objective (not shown) forming an illuminated rectangle of the dimensions of an elementary print.

By means of moving prisms p or reflecting mirrors, light from this source of illumination plays upon the film P and is projected on the elementary images in succession at the same time as a diaphragm D is displaced over the other face of the film, the rectangular opening d of which diaphragm had also the dimensions of an elementary print. Finally a rotatable high power objective having a very small field of view is located at O in such a way that the axis of the cylinder A cuts the optical axis at the focal point. This objective forms on a cylindrical surface A^1 the image of the film P and as the elementary positives are illuminated one after the other, the images are also successively formed side by side at A^1 one after the other. If the radius of the cylinder is equal to twice the principal focal length of the objective, the images will have the same size as the positives and the surface A^1 of the same radius as A will be on the same cylinder and symmetrical relative to the objective O.

By interposing in an emergent group of rays, a reflecting surface M, the images which would be normally formed at A^1 may be reflected in any suitably selected direction. Assuming that such a mirror M^1 reflects the picture A^1 to A^{11} the same calculation may be made and a similar construction employed for the second image, which may be called B^{11} (not shown), but instead of bringing B^{11} beside A^{11} it may be made to coincide with the latter. It suffices for this to give the mirror M^2 a slightly different inclination to that of the mirror M^1. If this is continued for each picture, the position necessary for the mirrors may be ascertained. For this, it is only necessary to consider the centre of each image.

In order that all the images may be equally superposed, it is necessary that the sum of the lengths of the incident ray and the reflected ray shall be constant, that is to say, that $OM^2+M^1A^{11}=OA^1$.

O and A^{11} are, however, two fixed points. The centres of the mirrors must therefore lie on an ellipse having the centres of the objective O and of the image A^{11} for foci.

If in such a system, there is placed at A^{11} a white screen or a ground glass, and the objective O is turned continuously towards the positives which are simultaneously uncovered by the diaphragm D and illuminated by the revolving prism p, an observer sees a single image continuously illuminated and strictly stationary, because in proportion as the diaphragm uncovers one of the elementary positives it conceals a corresponding part of the precedent print or picture. If the photographs placed at A have been taken one after the other, and if the subject comprises at this moment movable objects, such for example as persons in movement, the observer notices at A^{11} that the stationary objects retain this property under projection and that objects which are moving appear as in real life.

Consider a suitable illuminated object V (fig. 1),

If this object be observed through a convenient lens of large aperture or a divergent lens, the eye perceives between the object and

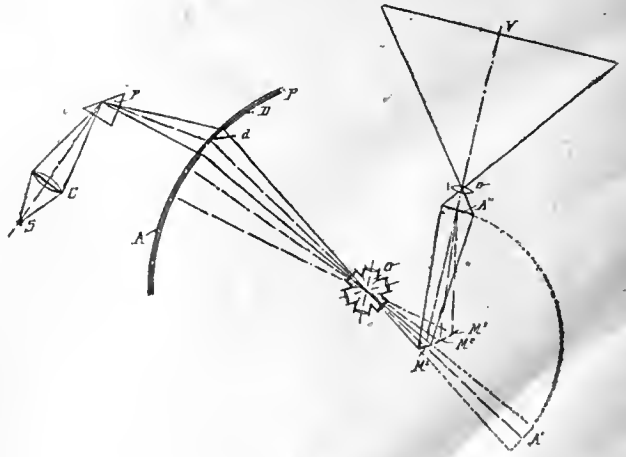


Fig. 1.

the lens and apparently on the lens, an actual clear image at the distance of distinct vision and for any superior distance.

It is this image which the objective of the apparatus must photograph after reflection of the rays by the series of mirrors placed on the elliptical surface.

The apparatus is thus composed of a suitable optical arrangement O adapted to give an image which is virtually erect or reversed to the object photographed.

A series of mirrors M placed in an ellipse and suitably regulated, repeats this image in as many juxtaposed images owing to the interposition of an objective O placed at one of the foci of the ellipse, the centre of the image occupying the other focus.

In the focal plane and along a cylinder A a sensitive film P is placed before which a rectangular diaphragm D having the dimensions of an elementary image is displaced.

At the commencement of the operation, the diaphragm being at one of the ends of the cylindrical surface A occupied by the film and the objective O being directed towards this same place, a first image is quite clearly printed.

After the portion of the cylinder, the length of the arc of which is equal to the product of the length of a print by the number of the mirrors, has been explored by the objective, a suitable arrangement replaces this portion of the film by another, the diaphragm and the objective return to their point of departure and everything recommences.

In order to avoid interruption, however short it may be, which would be necessary for this returning to their original positions of the diaphragm and the mirrors, a diaphragm in the form of an endless film or band may be assumed on the one hand carrying equidistant openings which form apertures, and on the other hand a multiple objective formed of several tubes regularly and symmetrically arranged about a common axis of rotation. In this case, for example, with an angle of exploration of 60 deg., the objective would be formed of 6 tubes constituting between them angles of 60 deg. and each carrying one of the two lenses of a similar symmetrical system.

The reproducing or projecting apparatus embodies the general principles explained, and is composed of :—

(1) A powerful source of light S;
(2) A revolving reflecting arrangement as prisms or mirrors *p*;
(3) A cylindrical surface A of glass of an arc of about 60 deg.;
(4) A revolving objective O having several symmetrical tubes.
(5) A series of mirrors placed on an elliptical surface M.
(6) A second, short, focus, objective o.

The positive film P formed by the series of pictures to be projected bears against the cylindrical glass surface A.

An endless, thoroughly opaque, band D perforated merely from place to place at suitable regular distances with a rectangular

Fig. 2.

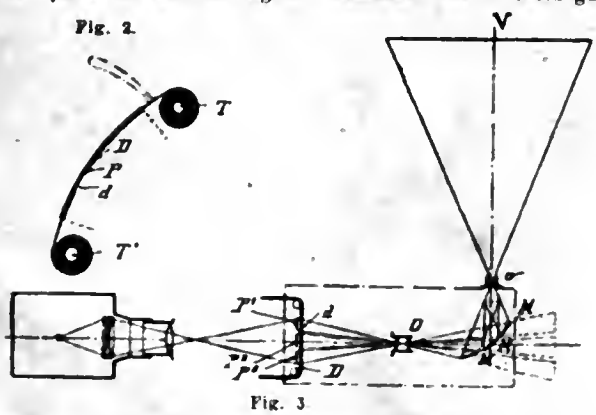


Fig. 3

opening *d* of the exact dimensions of an elementary print or picture may be displaced in front of this film.

The revolving optical reflecting arrangement *p*, the diaphragm D and the objective O are connected with the same mechanical control ensuring their movements being perfectly simultaneous.

Finally, quite as in the recorder, a suitable mechanical arrangement expels the film which has just been projected by drawing into its place the one which is to be projected a little later and by this movement gradually the length of film corresponding to that of the arm is completely renewed when the diaphragm having explored the last print or picture, the succeeding window commences the exploration of a fresh series of pictures.

In fig. 2 there is shown, for example, the film P stretched between two reels T T' and in front of and against it the diaphragm D is displaced. During this displacement the drum or reel T revolves, the film unwinds, forming a loop, the length of which is that of the arc when the window of the diaphragm has finished its course. At this moment the diaphragm brings up another window and suddenly the reel T' winds up the film, drawing the loop taut in front of the diaphragm in place of the arc which has just disappeared.

If, for example, the length of the arc is 60 centimetres, and each print of the picture has a base of 2 centimetres, the time of exploration by the window, for the rate of 15 prints or pictures per second, will be exactly two seconds.

During this relatively long time the foregoing mechanical action is very easily realisable.

As in the arrangement of fig. 1, the image V (fig. 3) furnished by an objective of large diameter or a divergent lens is photographed by a second objective O after reflection of the rays by three mirrors M or three prisms in such a way that three identical real images are formed normally and simultaneously in the focal plane where the sensitive surface P is found. The second objective O is, however, selected with a sufficiently long focus and with sufficient correction that the three elementary prints which are juxtaposed are formed on one plane surface (the number 3 may be any suitable number).

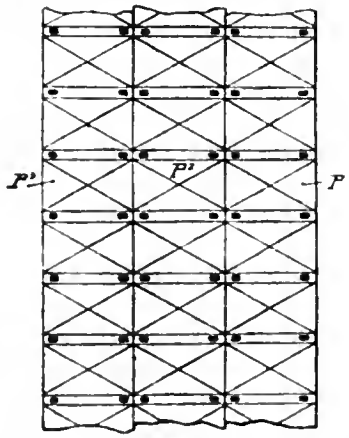


Fig. 4.

The whole is regulated so that the three elementary images are exactly juxtaposed without an interval reserved for any other object, such as that of perforations for moving them on. The correctness of this juxtaposition is indispensable to the absolute theoretical functioning of the apparatus.

If it be assumed that the elementary images are, as in the ordinary cinematograph, 35 mm. at the base by 20 mm. in height, the three images will be juxtaposed by the small side of the rectangle and their whole will thus form a horizontal rectangle of $35 \times 3 = 105$ mm. at the base by 20 mm. in height.

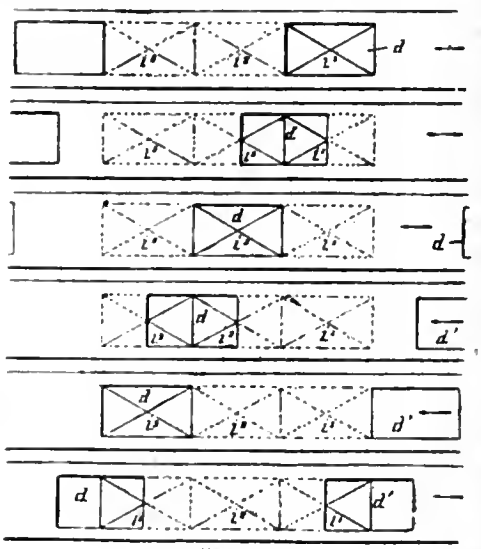


Fig. 5.

Here the ordinary objective O, formed of a single tube, remains immovable, and the number of the mirrors or prisms is reduced to three.

But instead of a single film there are three films, P^1, P^2, P^3, which are juxtaposed parallel and directed so that their axes coincide with the small axis of each image (fig. 4).

The width of each film is exactly equal to the base of a single elementary image, say, for example, 35 mm., the movement by means of points, cams or helices, or by any other suitable arrangement is no longer produced by means of holes formed in the white

margin reserved on the sides of the film. These holes are in an interval reserved between each elementary print or picture on the same band.

An endless, flexible and opaque curtain D, perforated with equidistant windows, is displaced in a continuous manner before these three films, and following a direction parallel with the base of the images. Each window is of exactly the dimensions of an elementary image and the interval between two successive windows d, d^1 is equal to twice the larger base of these same imagee (fig. 5).

When the operation commences it is assumed that the window d will totally illuminate the first elementary print or picture, whilst the two identical images i^2, i^3 are formed on the opaque part of the endless shutter. The first film P^1 is then printed without there being any action on the other two P^2 P^3, but at this moment the shutter band D is being displaced and the second elementary image is printed on P^2, whilst successively the parts corresponding to P^1 are covered. When the second image i^2 is entirely exposed, the first film P^1 is no longer concerned, and it is then that its displacement is produced. This displacement in order to be produced has all the time taken by the window for reaching the extreme edge of the third film P^3.

It is then the turn of the second film P^2 to be displaced whilst the curtain commencing to mask P^3, the second window d^1 commences to illuminate P^1 in its fresh position. On this film P^1 a second print, the fourth of the series, is printed above the first i^1, and when it is fully exposed P^3, which is completely eclipsed, commences its displacement, and so forth up to the end of the operation. The diagrammatic description just given of the apparatus for taking views enables the projecting apparatus (fig. 3) to be immediately understood.

Here, there are, of course, three prisms or mirrors M, the objective O placed between these latter and the diapositivea P and finally the curtain D with windows d placed in front of the three films P^1, P^2, P^3, which are shown and moved according to the same rules as for taking the views.

The objective with wide aperture or the divergent lens are here alone replaced by the short focus projecting objective o.

For cinematography in colours, the statements above, as a whole, may be repeated as regards the theoretical arrangement. However, for taking views, or their projection, the apparatus is presented in the following way :—

Nine elementary prints or pictures are simultaneously exposed because each of the three films is printed at the same time with three identical pictures placed vertically one above the other opposite the large sides of the rectangles. But, for this, intimate juxtaposition is no longer necessary, and between each print there continues to be reserved the indispensable perforated spaces for moving the film as in fig. 4. Before each image of this vertical series one of three coloured filters is placed. This causes, by reason of the three parallel films, the rectangle formed of nine images to be seen through three horizontal glass bands, constituting in one case one of the ternary colours, and in the other cases the other ternary colours.

The window has a treble height. If, for example, the images are 35×20 and the reserve and perforated spaces 35×3;

A. The bands of coloured glass are 105×20 mm ;

B. The window is $35 \times (20+3+20+3+20)$ or 35×66 mm.

The inverse reasoning is applicable to the apparatus for taking polychrome views.

To all the technical advantages which characterise this improved cinematograph process as a whole, there must be added others of a material nature.

First of all, by reason of the continuity of the view, there is no necessity imposed of multiplying beyond measure the number of elementary pictures, and from this fact there must result a considerable saving in the consumption of films.

On the other hand, the substitution of a space reserved between two images for the two margins habitually employed also constitutes a saving, less evident than the foregoing, but nevertheless appreciable, if the length of the films at present employed in cinematography be considered.

Practical Color Photography. — Our publishers, Messrs. Henry Greenwood and Co., Ltd., who are supplying the new manual, "Practical Color Photography," by Mr. E. J. Wall, inform us that following the rapid exhaustion of the first delivery from the American publishers, they have now received a second consignment, and are able to supply the book post free to any part of the world at the price of 13s. 3d.

AUTOCHROMES AND SUN SPOTS.

Among writers in France on Autochrome work reference has been somewhat frequently made of late to the tendency of the Autochrome plate to give results, the colour rendering of which is somewhat on the bluish side. Several workers have made suggestions of means by which this effect may be prevented, such as the use of different compensating light-filters, but no one hitherto appears to have suggested the cause of the phenomenon except by the assumption that either the mosaic filter or the emulsion is not the same as that previously manufactured by MM. Lumière. The latter, however, have been able to give their very positive assurance that the product remains identical with that issued as long ago as in the years before the war, since the materials are taken from precisely the same stock.

A remarkable suggestion respecting the cause has recently been put forward, namely that it is a variation in the spectral composition of solar light, due to the occurrence of spots on the sun. This theory is ventilated in an article in a recent issue of "Photo-Revue," where M. J. Lacroix discusses it, and receives the support of M. L'Abbé Moreux, superintendent of Bourges Observatory. M. Lacroix writes :—My experience confirms that of many other amateurs. After having closely noticed that for a considerable time my results tended towards a bluish tone, I made numerous comparisons, not simply on single plates but with series of exposures, and communicated the results to MM. Lumière. I learnt that the manufacture remained identically the same; the same emulsions and the same dyes, taken from existing stock. After a certain lapse of time I repeated my tests, but with the same results, and was thus led to the belief that some unknown cause required to be found to account for the difference. Although the suggestion may arouse ridicule, I will state it nevertheless. May it not be that the sun itself is responsible for the difference in the colour rendering. At a conference held at Agen three or four years ago M. L'Abbé Moreux, in the course of a lecture on various astronomical subjects, referred to sun spots. It appeared to me that, in addition to the many great results which coincide with the occurrence of spots on the sun, a difference in the results on Autochrome plates may be included, and on putting this question specifically to M. Moreux, he replied that it was quite possible that there was a difference in the solar radiation requiring a modification of the colour sensitiveness of the plates or an alteration in the compensating light-filters. MM. Lumière, in their turn, expressed the view that if such modification had shown itself to be necessary they would have had experience of it in the course of their tests, but, on the other hand, it is possible that MM. Lumière's tests are not made under such various conditions of light, subject, time of year, etc., as are those undertaken by the ordinary users of the plates. In some circumstances the tendency to blueness is scarcely appreciable and even entirely absent. In photographing subjects which are fairly close to the camera and are taken in a bright light, at about midday, the results are excellent when correctly exposed and developed. But in the early morning, or late evening, when the light is rich in colour, subjects which include great distances exhibit, as regards these portions, a very marked blueness. I can only suppose that MM. Lumière have not made tests with this particular kind of subject and, therefore, have not experienced the necessity for some modification of the process. Nevertheless, my own experience with subjects in which the light reaches the camera through large areas of the atmosphere leads me to believe that same modification of the compensating filters or the colour-sensitiveness of the emulsion has become necessary. I am very far from wishing to dogmatise in this matter, and have written solely for the purpose of eliciting the experience and enlisting the collaboration of all those who have derived such great pleasure from the marvellous results with the Autochrome process.

Three-Colour Transparencies.—In reference to the paper by Mr. Frederic G. Tutton, which appeared in the "Colour Photography" Supplement for November 3 last, Mr. Tutton writes to inform us that in common with the "Club Photographer" a misstatement was made respecting the exhibit of his to which a medal was awarded at the recent exhibition of the Royal Photographic Society. The transparency which secured the award at the R.P.S. was not made by the process described last month, but by three-colour carbon with subsequent intensification of the colours as described in the catalogue.

The British journal of photography